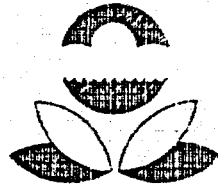


START**Superfund Technical Assessment and Response Team
- Region VIII****United States
Environmental Protection Agency****Contract No. 68-W5-0031****EMERGENCY RESPONSE
TRIP REPORT****RICO TOWN POND SITE
Rico, Dolores County, Colorado****TDD No. 0004-0010****May 5, 2000****URS****OPERATING SERVICES, INC.****In association with:****Tetra Tech EM Inc.
URS Greiner Woodward Clyde
Maxim Technologies, Inc.
LT Environmental, Inc.
The Roybal Corporation**

**RICO TOWN POND
Emergency Response Trip Report**

**U.S. EPA Contract No. 68-W5-0031
TDD No. 0004-0010**

**Prepared By:
Les Sims**

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Approved: _____
T. F. Staible, Team Leader, UOS

Date: _____

Approved: _____
Les Sims, Project Leader, UOS

Date: _____

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OSC, EPA Region VII

DOLORES COUNTY MAYOR'S OFFICE

Eric Heil

Town Manager
P.O. Box 189
Rico, Colorado 81332

URS OPERATING SERVICES, INC.

Les Sims
File (2 copies)

START Project Leader, EPA Region VIII
START, EPA Region VIII

TRIP REPORT

Rico Town Pond Rico, Dolores County, Colorado

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1.0 INTRODUCTION

URS Operating Services, Inc. (UOS), was tasked by the Environmental Protection Agency (EPA), under the Superfund Technical Assessment and Response Team (START) contract # 68-W5-0031, Technical Direction Document (TDD) No. 004-0010, issued on April 14, 2000, to provide technical support to the Region VIII On-Scene Coordinator (OSC) in conjunction with an emergency response involving the release of heavy metals from a settling pond, located at the Rico Town Pond site (site), into the Dolores River. Specifically, START was tasked to provide site reconnaissance, environmental sampling, analytical support, and documentation of site activities conducted during this event.

The site is located at the St. Louis Tunnel property in Dolores County, near Rico, Colorado. (Figure 1). As a result of heavy spring surface water runoff in the area, the primary settling pond located at the site overflowed and released an undetermined amount of heavy metals into the Dolores River.

Site activities related to this response were conducted on April 14, 2000, and included the collection of twelve environmental samples consisting of five surface water samples, five sediment samples, and two field Quality Assurance/Quality Control (QA/QC) samples (Figure 2). Additionally, extra surface water and sediment volumes were collected during sampling activities for laboratory matrix spike/matrix spike duplicates (MS/MSD). As part of the surface water sampling effort, a Hydac® Model 2450 test system was utilized to record standard water parameters including pH, temperature, and conductivity. The samples collected during this event were submitted via overnight express service to an approved laboratory for Target Analyte List (TAL) metals analysis.

Non-sampling activities conducted during this response included photographic documentation of possible attribution and sampling locations; reconnaissance of the Dolores River and tributaries located between the site and Rico; and historical research related to prior ownership, usage, and operations of the site property.

2.0 SITE BACKGROUND

The Rico Town Pond site is located in the Rico Mountains of southwestern Colorado, due east of the Dolores River, approximately 3/4 miles north of the town of Rico in Eastern Dolores County, Colorado (Figure 1). The legal description of the site is the southeast quarter of Section 25, T. 40 N, R. 11 W. The approximate site coordinates are 37° 42' 05" North latitude and 108° 01' 39" West longitude (U.S. Geological Survey

(USGS) 1960). The site can be reached by proceeding south from Telluride, Colorado, on State Highway 145 over Lizard Head Pass to the town of Rico, or by proceeding north from Cortez, Colorado, on State Highway 145 to the town of Rico. The Rico Town Pond site is a group of 11 settling ponds and 2 hot spring-fed ponds located at the defunct St. Louis Tunnel sulfuric acid plant.

The Rico area has an extensive mining history of which a detailed account can be found in the Site Inspection Prioritization Report (URS Consultants, Inc. (URS) 1994). All mining operations ceased in 1971 and most of the mine workings were allowed to flood and drain through the St. Louis Tunnel. Water from the underground mine workings drains from the St. Louis Tunnel adit and flows into the settling pond system prior to discharging into the Dolores River. Anaconda Minerals Company (AMC) purchased the property in 1980 and completed several environmental efforts to mitigate the impact of contaminants to groundwater and main waterways in the surrounding area, including constructing the aforementioned treatment system to collect St Louis Tunnel discharge, capping wells, plugging adits, and stabilizing tailings and treatment ponds (Anaconda Minerals Company (AMC) 1994). The EPA collected surface water and sediment samples from Silver Creek and the Dolores River during a site inspection conducted in November 1984. Analytical results related to that effort indicated that the surface water and sediments contained elevated concentrations of arsenic, cadmium, copper, iron, lead, manganese, and zinc (Ecology and Environment (E&E) 1985).

The Rico Development Corporation purchased the property in 1988 (Colorado Department of Public Health and the Environment (CDPHE) 1988). Notice of Violations (NOVs) were issued to Rico Development Corporation in 1990 for violations of the National Pollution Discharge Elimination System (NPDES) permitted discharge levels of lead and silver standards, in 1993 for violations of the silver standards, and in 1994 for violations of silver, lead, and zinc standards (U.S. Environmental Protection Agency (EPA) 1994; CDPHE 1995). Town records indicate that ownership of the property was transferred from the Rico Development Corporation to Rico Properties LLC in 1994 (Rico 2000). In April 2000, as the result of spring runoff to the site, an undetermined volume of heavy metals-contaminated water and sediments overflowed from the primary settling pond into the Dolores River.

3.0 SITE ACTIVITIES AND OBSERVATIONS

UOS START members Les Sims (project leader) and Paul Schnitz (environmental scientist) accompanied OSC Tien Nguyen to the Rico Town Pond site on April 14, 2000. At 0850 hours EPA and START attended a town meeting to discuss site conditions and the proposed work plan. Attending the meeting was Mayor

Joseph Croke and town representatives David Kunz and Eric Heil. During this meeting EPA was informed that, as a result of heavy spring runoff to the site, the primary settling pond located at the St. Louis Tunnel property overflowed into the nearby Dolores River.

Field activities conducted by START included site reconnaissance and the collection of surface water and sediment samples at the St. Louis Tunnel settling ponds and the Dolores River (Photos 1 through 12). At 0945 hours, a reconnaissance of the site was completed by START, which confirmed the overflow of the primary settling pond into the Dolores River. Additionally, a small unnamed perennial stream located between the property and the Dolores River also appeared to be impacted by the overflow. Sampling activities conducted at the site by START were initiated at 1000 hours and completed at approximately 1300 hours. A total of 12 samples were collected during this effort including six surface water samples and six sediment samples (Table 1) (Figure 2). Weather conditions in the area consisted of overcast skies with light to moderate winds out of the south and intermittent precipitation. The ambient temperature remained relatively constant during sampling activities at 48°F. On April 14, 2000, following the completion of all assigned tasks, START demobilized from the Rico Town Pond site.

The samples were shipped via overnight express service from Montrose, Colorado, to Compu Chem Laboratory, 501 Madison Avenue, Cary, North Carolina, and analyzed for TAL metals. On April 17, 2000, at 1330 hours, analytical results related to these samples were received by START via facsimile from the laboratory. The analytical report provided evidence that some of the surface water and sediment samples collected during this effort revealed heavy metals contamination above the laboratory reporting limits. The highest concentrations of heavy metals were from sediment samples collected at the surface water impoundment located east of the primary settling pond (Figure 2).

Analytical results related to this effort are summarized in Section 5.0 and in Tables 2 and 3 of this report. Also, a detailed report of all analytical results and laboratory reporting limits is included in Appendix C.

4.0 QUALITY ASSURANCE/QUALITY CONTROL

Two duplicate samples and two MS/MSD samples were collected during this event to evaluate the precision of sample collection procedures and laboratory analyses in accordance with the "UOS Generic Quality Assurance Project Plan" (URS Operating Services, Inc. (UOS) 1995a). All samples were handled and preserved as described in UOS TSOP 4.2, "Sample Containers, Preservation and Maximum Holding Times."

All non-disposable sampling equipment was decontaminated after the collection of each sample in accordance with UOS TSOP 4.11, "Equipment Decontamination." Following sample collection and identification, all samples were handled in strict accordance with the chain-of-custody protocol specified in UOS TSOP 4.3 "Chain of Custody" (UOS 1995b).

5.0 ANALYTICAL RESULTS AND DATA INTERPRETATION

Laboratory analytical results are included in Appendix C and are listed in Tables 2 and 3. A brief discussion of some of the analytes detected above background levels is in Sections 5.1 and 5.2. A more detailed discussion of analytical results are presented as part of Appendix D of this report. The sample data collected during this event were reviewed by START utilizing standard UOS guidelines for analytical data interpretation. Analytical results of TAL metals reported in Tables 2 and 3 at concentrations above the laboratory reporting limits are indicated by bold type.

5.1 SURFACE WATER ANALYTICAL RESULTS

Analysis of surface water samples revealed the detection of heavy metals above background levels in the following samples: RS-SW-1(cadmium at 21.5 micrograms per liter ($\mu\text{g}/\text{l}$)) and RS-SW-2 (cadmium and lead at 17.5 and 10.7 $\mu\text{g}/\text{l}$, respectively).

5.2 SEDIMENT ANALYTICAL RESULTS

Analysis of sediment samples revealed the detection of heavy metals above background levels in the following samples: RS-SE-1 (Arsenic at 48.4 milligrams per kilogram (mg/kg), chromium at 38.4 mg/kg, and lead at 1,180 mg/kg), RS-SE-2 (arsenic at 11.4 mg/kg, cadmium at 114 mg/kg, chromium at 11.3 mg/kg , and lead at 200 mg/kg), and RS-SE-5 (arsenic at 35.1 mg/kg, cadmium at 51.4 mg/kg, chromium at 15.7 mg/kg, and lead at 796 mg/kg).

6.0 SUMMARY

On April 13, 2000, START was tasked by EPA to accompany the OSC to the Rico Town Pond site in Dolores County, Colorado. The site is located at the St. Louis Tunnel property near Rico, Colorado. A system of 11 settling ponds is designed to collect surface water drainage from the inactive underground mine and then discharge the water into the Dolores River. As a result of heavy spring surface water runoff in the area, the primary settling pond located at the site overflowed and released an undetermined amount of heavy metals into the Dolores River.

Site activities related to this response were conducted on April 14, 2000, and included site reconnaissance and environmental sampling. Reconnaissance of the site conducted by START identified the overflow at the west berm of the primary settling pond. Sampling activities conducted by START included the collection of twelve environmental samples including six surface water samples and six sediment samples. The samples collected during this event were submitted via overnight express service to an approved laboratory for total heavy metals analysis. A rush turnaround time for sample analysis was requested by the OSC. Sample analysis submitted by the approved laboratory provided evidence that some of the surface water and sediment samples collected during this event revealed heavy metals contamination above the laboratory reporting limits. The highest concentrations of heavy metals were from sediment samples collected at the surface water impoundment located east of the primary settling pond.

Non-sampling activities conducted during this response included photographic documentation of possible attribution and sampling locations; reconnaissance of the Dolores River and tributaries located between the site and the town of Rico; and historical research related to prior ownership, usage and operations of the site property. Site activities related to this event were conducted on April 13 and 14, 2000. Analysis of the samples submitted during this event was completed on April 17, 2000.

7.0 LIST OF REFERENCES

Anaconda Minerals Company (AMC). 1994. Personal communication of URS Consultants, Inc. with Bob Dent, Minerals Environmental Manager. May 20, 1994.

Colorado Department of Public Health and the Environment (CDPHE). 1988. Application for Transfer and Acceptance of Terms of a Colorado Permit. July 25, 1988.

Colorado Department of Public Health and the Environment (CDPHE). 1995. A review of the CSPHE Water Quality Control Division's files for the Rico-Argentine CDPS Permit No. CO-0029793.

Dunne, Thomas and Luna B. Leopold. 1978. "Water in Environmental Planning." W. H. Freeman and Company, San Francisco.

Ecology and Environment, Inc. (E&E). 1985. Analytical Results for Rico-Argentine Mine, Rico, Colorado. Prepared by Meg Babits. July 29, 1985.

State of Colorado, Department of Natural Resources, Bureau of Mines (BOM). 1974. Information Report by District No. 4 Metal Mining Inspector, Thomas D. High. December 5, 1974,

State of Colorado, Department of Natural Resources, Bureau of Mines (BOM). 1975. Information Report by District No. 4 Metal Mining Inspector Thomas D. High. July 17, 1975.

State of Colorado, Department of Public Health and the Environment (CDPHE). 1988. Application for Transfer and Acceptance of Terms of a Colorado Permit. July 25, 1988.

State of Colorado, Department of Public Health and the Environment (CDPHE). 1995. Review of files.

Rico, Dolores County, Colorado. 2000. Personal conversations held on April 14, 2000 with Mayor Joseph Croke, Town Trustee David Kunz, and Town Manager Eric Heil concerning present and historical information related to the Rico Town Pond site and St Louis Tunnel property.

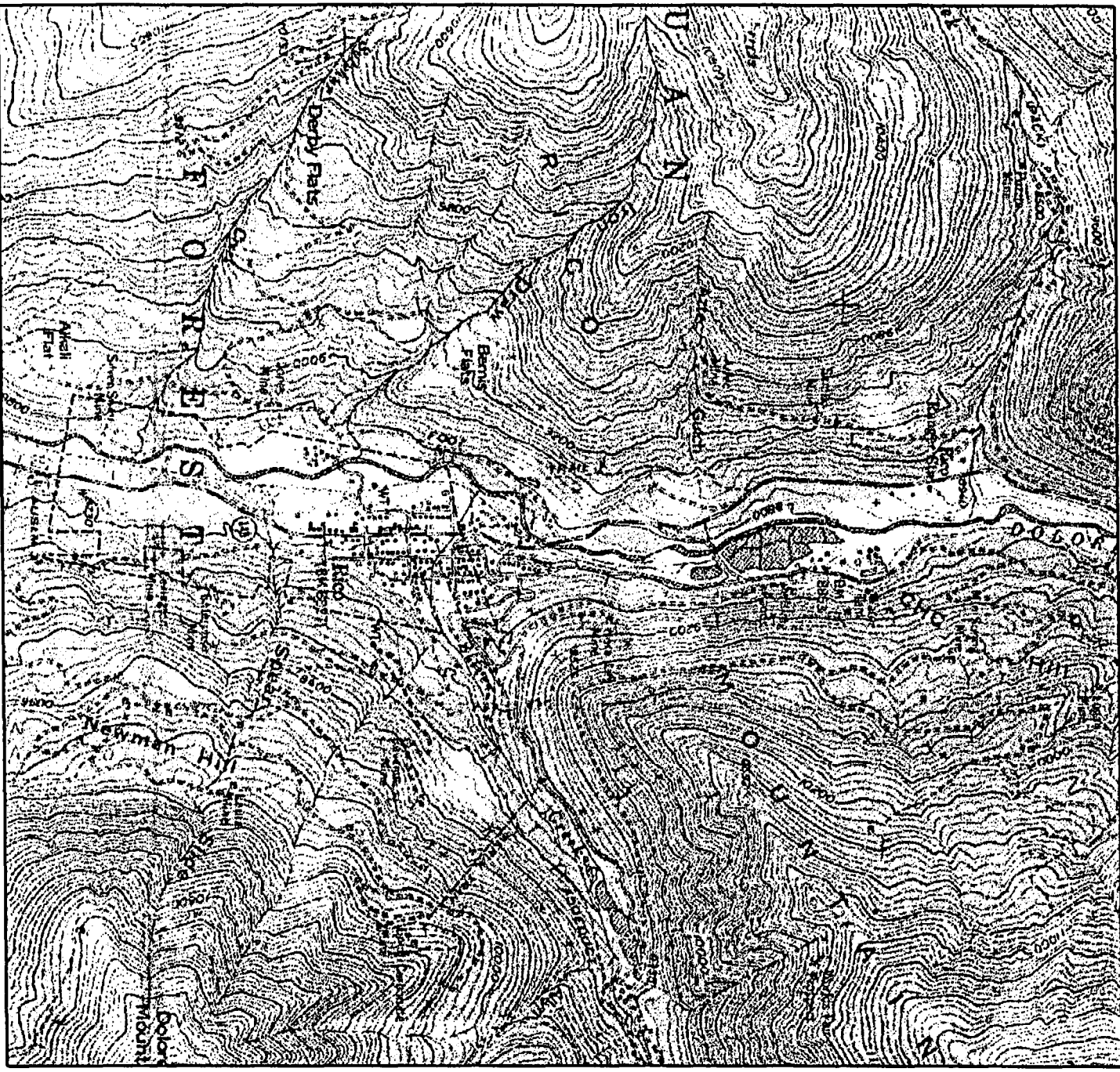
U.S. Environmental Protection Agency (EPA). 1994. File review conducted by URS Consultants, Inc.

U.S. Geological Survey (USGS). 1960. 7.5-Minute Series Topographic Quadrangle, Rico, Colorado. (Photoinspected 1975).

URS Consultants, Inc. (URS) 1994. Site Inspection Prioritization, Rico-Argentine, Rico, Colorado.

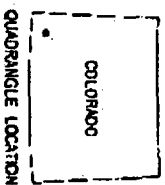
URS Operating Services, Inc. (UOS). 1995a. "Generic Quality Assurance Project Plan for the Superfund Technical Assessment and Response Team (START) contract, EPA Region VIII." December 1995.

URS Operating Services, Inc. (UOS). 1995b. "Technical Standard Operating Procedures (TSOP) for the Superfund Technical Assessment and Response Team (START) Contract, EPA Region VIII." December 1995.



SOURCE: USGS QUADRANGLE
RICO, COLORADO
1960 PHOTOINSPECTED 1975

2000 0 2000
SCALE: 1" = 2000'



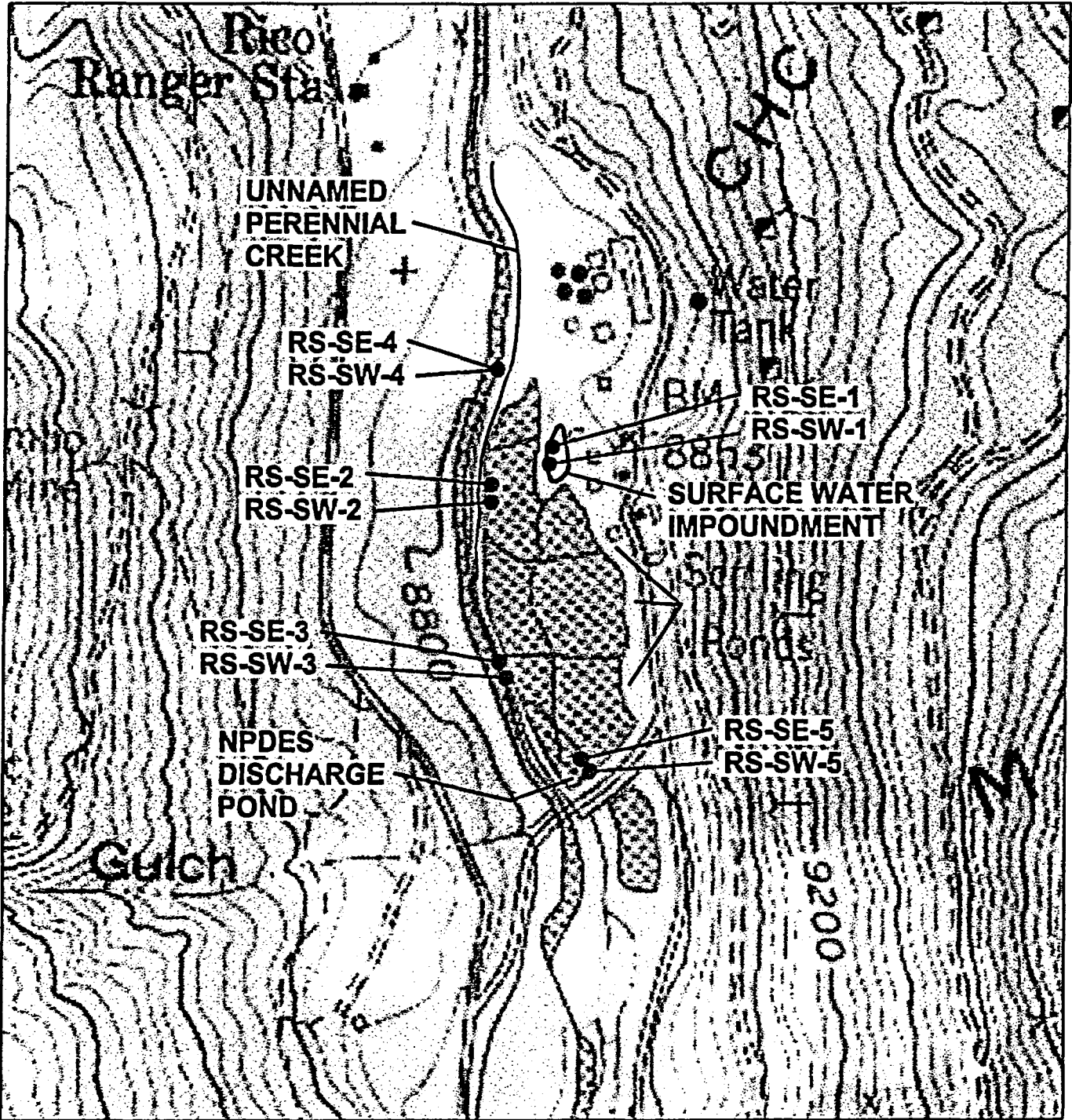
UOS-START
URS Job No. 75-00410.00

RICO TOWN POND
RICO COLORADO
Site Location Map
Figure 1

May 2000

URS
OPERATING SERVICES

75-00410.00



SOURCE: USGS QUADRANGLE
 RICO, COLORADO
 1960 PHOTOINSPECTED 1975

600 0 600
 SCALE: 1" = 600'



UOS-START
 URS Job No. 75-00410.00

RICO TOWN POND
 RICO COLORADO
Sample Location Map
 Figure 2

May 2000

URS
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TABLE 1
Sample Locations and Rationale

Sample Matrix	Sample ID	Location	Rationale
Surface Water	RS-SW-1	Surface water impoundment located immediately east of primary settling pond on site.	Test for the presence of heavy metals.
	RS-SW-2 (MS/MSD)	Primary settling pond.	Test for the presence of heavy metals. MS/MSD collected to test the precision of lab methods
	RS-SW-3	Downstream of primary settling pond	Test for the presence of heavy metals.
	RS-SW-4	Upstream of primary settling pond.	Establish background conditions on Dolores River upstream of site.
	RS-SW-5	NPDES discharge pond	Test for the presence of heavy metals.
	RS-SW-6	Duplicate of RS-SW-2.	Document precision of sample collection procedures and lab analysis.
Sediment	RS-SE-1	Surface water impoundment located immediately east of primary settling pond	Test for the presence of heavy metals
	RS-SE-2	Primary settling pond.	Test for the presence of heavy metals.
	RS-SE-3	Downstream of primary settling pond.	Test for the presence of heavy metals.
	RS-SE-4	Upstream of primary settling pond.	Establish background conditions at Dolores River upstream of site.
	RS-SE-5	NPDES discharge pond	Test for the presence of heavy metals.
	RS-SE-6	Duplicate of RS-SE-2.	Document precision of sample collection procedures and lab analysis.

TABLE 2
Surface Water Sample Results - TAL Metals
Concentrations in $\mu\text{g}/\ell$ (ppb)

Sample ID: Lab Sample ID: Location:	RS-SW-4 Q1241-4 Upstream of site (background)	RS-SW-1 Q1241-1 Impoundment east of primary pond	RS-SW-2 Q1241-2 Primary settling pond	RS-SW-6 Q1241-6 Duplicate of RS-SW-2	RS-SW-3 300Q1241-3 Downstream of primary settling pond	RS-SW-5 Q1241-5 NPDES discharge pond
Aluminum (Al)	334	339	264	274	300	[46.6]
Antimony (Sb)	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
Arsenic (As)	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
Barium (Ba)	72.8	25.2	24.1	23.3	71.1	20.9
Beryllium (Be)	[0.28]	[0.88]	[0.58]	[0.60]	[0.24]	[0.32]
Cadmium (Cd)	0.20 U	21.5	17.4	16.8	0.20 U	5.7
Calcium (Ca)	32,000	250,000	245,000	236,000	33,100	236,000
Chromium (Cr)	0.40 U	0.40 U	0.40 U	[0.56]	0.40 U	0.40 U
Cobalt (Co)	0.50 U	[4.0]	[3.2]	[3.1]	0.50 U	[1.8]
Copper (Cu)	0.60 U	42.7	27.0	21.7	0.60 U	[2.5]
Iron (Fe)	276	6,080	2,600	2,280	277	717
Lead (Pb)	1.3 U	4.8	10.7	9.5	1.3 U	[2.8]
Magnesium (Mg)	5,110	20,600	20,900	20,200	5,180	21,300
Manganese (Mn)	27.9	2,100	1,900	1,830	46.4	1,540
Mercury (Hg)	[0.12]	[0.13]	0.10 U	[0.11]	0.10 U	[0.11]
Nickel (Ni)	[0.75]	7.3	5.5	5.9	[1.1]	[3.5]
Potassium (K)	[801]	1,810	1,810	1,740	[792]	2,600
Selenium (Se)	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
Silver (Ag)	0.60 U	0.60 U	0.60 U	0.60 U	0.60 U	0.60 U
Sodium (Na)	2,470	13,000	11,800	11,300	2,480	12,600
Thallium (Tl)	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U	3.2 U
Vanadium (V)	[0.67]	[0.81]	0.40 U	0.40 U	[0.64]	0.40 U
Zinc (Zn)	[1.4]	4,490	3,570	3,400	[2.6]	1,320

Bold Analyte detected above the laboratory reporting limit
U Analyte not detected at laboratory reporting limit
[] Estimated value. Analyte detected below the laboratory reporting limit
ppb parts per billion
 $\mu\text{g}/\ell$ microgram per liter

TABLE 3
Sediment Sample Results - TAL Metals
Concentrations in mg/kg (ppm)

Sample ID: Lab Sample ID: Location:	RS-SE-4 R1241-4 Upstream of site (background)	RS-SE-1 R1241-1 Impoundment east of primary pond	RS-SE-2 R1241-2 Primary settling pond	RS-SE-6 R1241-6 Duplicate of RS-SE-2	RS-SE-3 R1241-3 Downstream of primary settling pond	RS-SE-5 R1241-5 NPDES discharge pond
Aluminum (Al)	5,490	31,000	14,100	13,800	5,170	12,100
Antimony (Sb)	[0.80]	[8.5]	[2.6]	[2.5]	[0.42]	[4.5]
Arsenic (As)	10.1	48.4	11.4	12.6	9.5	35.1
Barium (Ba)	104	280	29.5	54.3	89.3	200
Beryllium (Be)	[0.64]	19.2	8.5	8.6	0.65	4.3
Cadmium (Cd)	0.76	115	114	113	[0.40]	51.4
Calcium (Ca)	9,670	26,000	83,400	88,300	36,600	7,790
Chromium (Cr)	7.4	38.4	11.3	10.1	7.6	15.7
Cobalt (Co)	5.8	24.4	12.7	14.2	5.6	56.9
Copper (Cu)	26.3	4,190	2,460	2,370	14.7	722
Iron (Fe)	16,900	281,000	128,000	120,000	14,900	80,200
Lead (Pb)	41.6	1,180	200	276	26.3	796
Magnesium (Mg)	4,250	17,600	2,660	4,160	4,060	7,040
Manganese (Mn)	830	10,900	4,260	5,330	508	19,000
Mercury (Hg)	[0.05]	[0.38]	[0.21]	[0.15]	0.04	[0.11]
Nickel (Ni)	11.8	44.4	23.3	24.2	11.3	40.8
Potassium (K)	1,080	2,990	[225]	[459]	1,310	1,730
Selenium (Se)	0.33 U	3.9 U	2.3 U	1.5 U	0.26 U	3.4
Silver (Ag)	[0.62]	19.5	[0.85]	[2.1]	0.07 U	17.0
Sodium (Na)	[216]	3,980	8,600	1,990 U	[224]	1,400
Thallium (Tl)	[1.4]	27.1	12.9	11.7	[0.70]	6.7
Vanadium (V)	14.9	41.6	[7.5]	[8.4]	12.9	18.0
Zinc (Zn)	157	23,700	27,000	25,300	94.1	7,760

Bold Analyte detected above the laboratory reporting limit
U Analyte not detected at laboratory reporting limit
[] Estimated value. Analyte detected below the laboratory reporting limit
mg/kg milligram per kilogram
ppm parts per million

TABLE 4
Surface Water Parameters

Sample ID	Location	pH	Temp(°F)	Conductivity (μs/m³)
RS-SW-1	Surface water impoundment	4.9	53.2	1338
RS-SW-2	Primary settling pond	6.8	49.8	5000
RS-SW-3	Downstream of primary settling pond	6.9	50.0	3300
RS-SW-4	Upstream of primary settling pond	7.02	44.1	2970
RS-SW-5	NPDES discharge pond	6.2	48.3	3180

APPENDIX A

Photolog



PHOTO 1

Photo facing northwest of primary settling pond. Surface water and sediments overflow occurred at this pond.

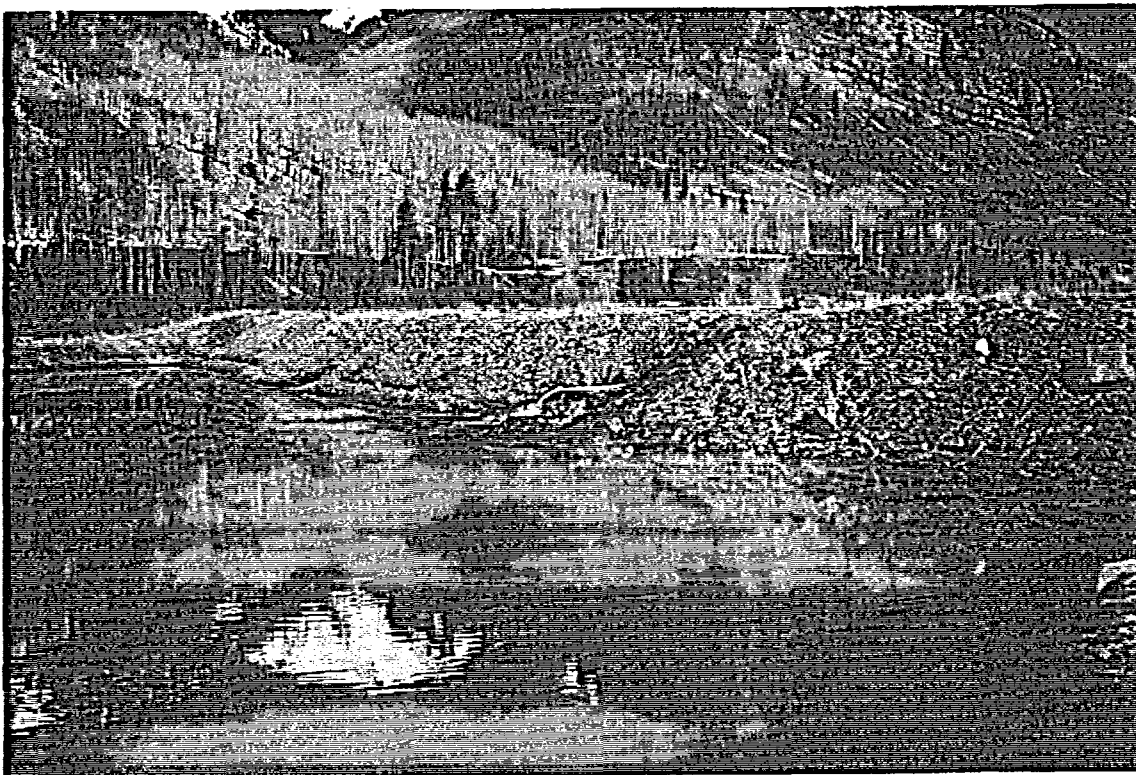


PHOTO 2

Photo facing northwest of berm between primary settling pond and pond #2.
Photo shows decant/overflow from primary settling pond into pond #2.

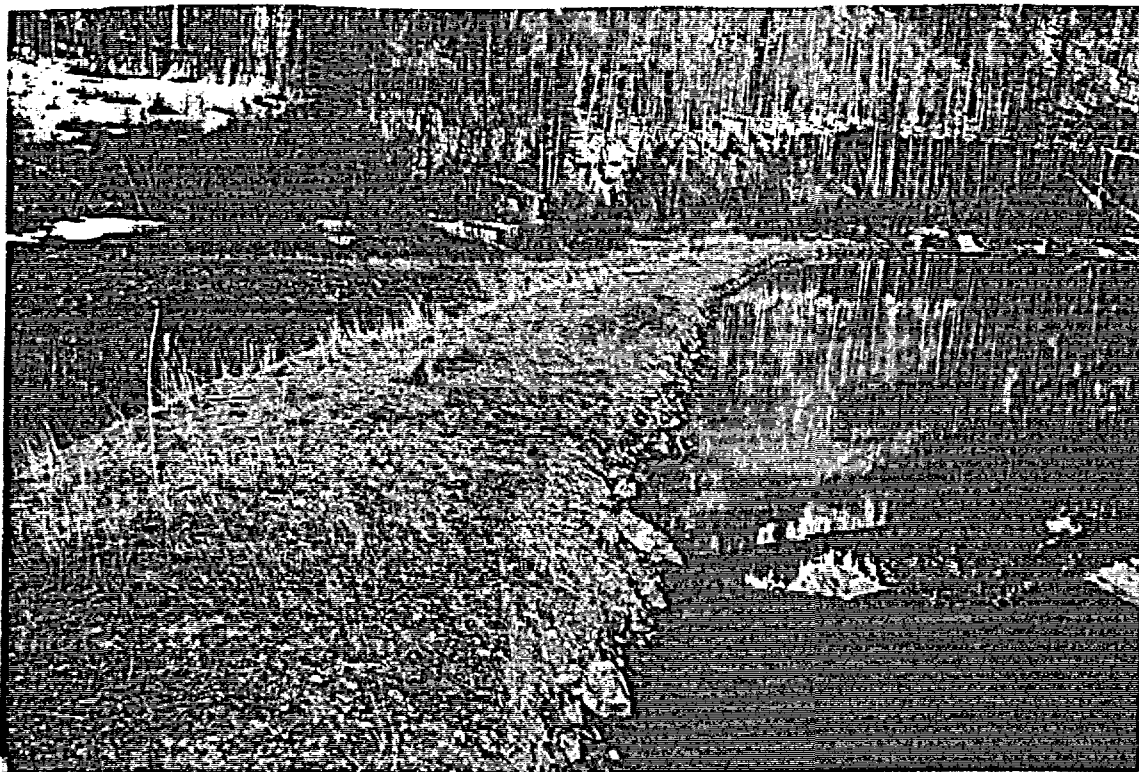


PHOTO 3

Photo facing northwest of berm separating primary settling pond and pond #2.
Freeboard at this point is approximately 10 inches.

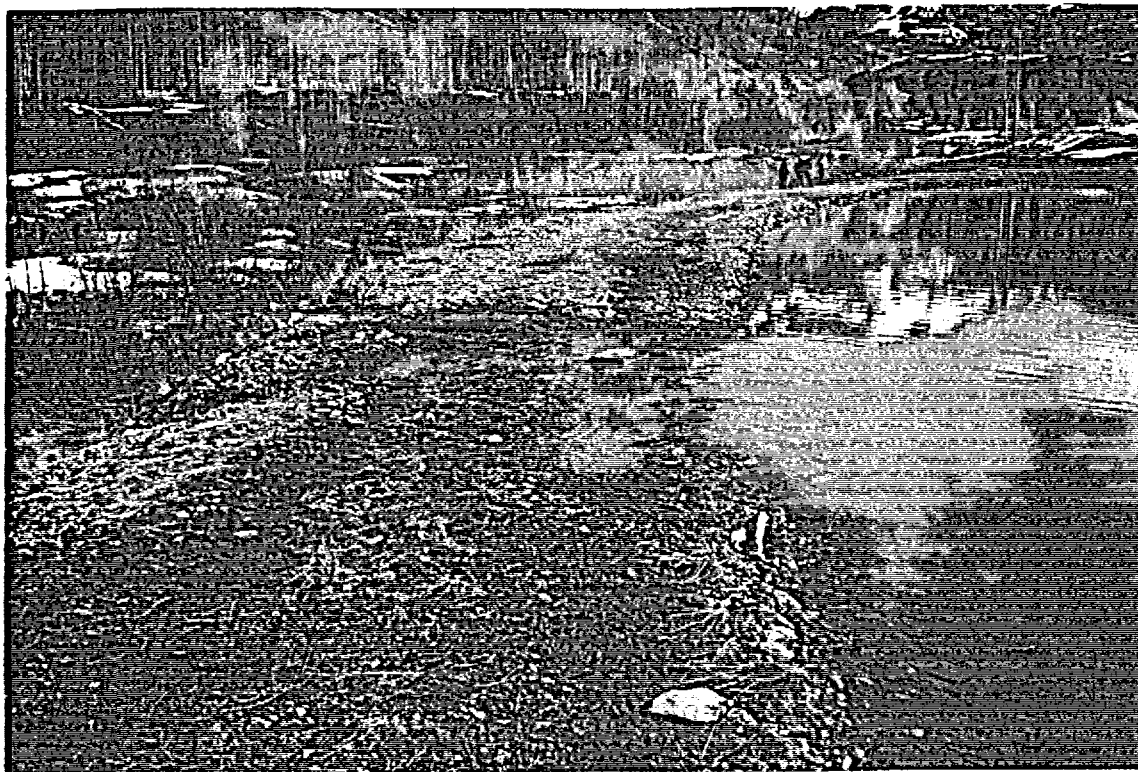


PHOTO 4

Photo facing northwest of low point in west berm of primary settling pond where overflow occurred. A small stream and the Dolores River are pictured to the left.



PHOTO 5

Photo facing west-southwest of runoff path from primary settling pond (RS-SW-2) into a small stream that flows into the Dolores River



PHOTO 6

Photo facing east of the west bank of the primary settling pond showing where overflow has eroded the outer berm. Note the small stream at the base of the berm.

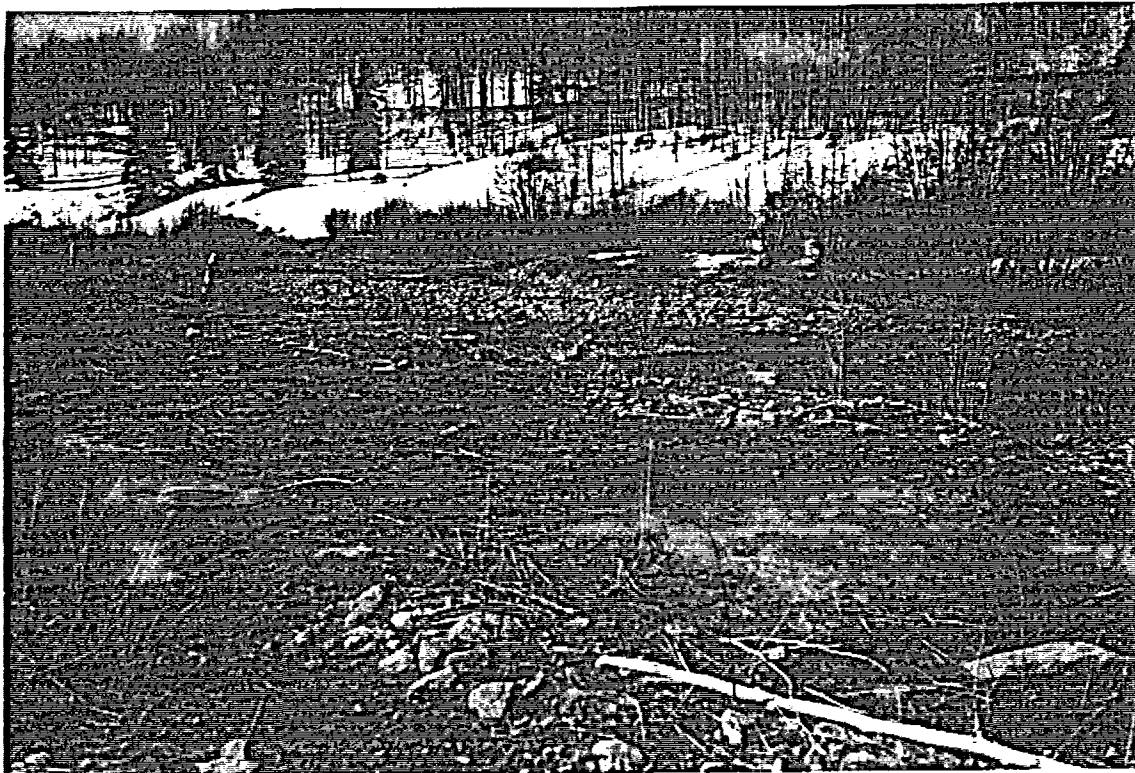


PHOTO 7

Photo facing southwest of the top of the west berm of the primary settling pond where overflow into the stream and river occurred (RS-SW-2).

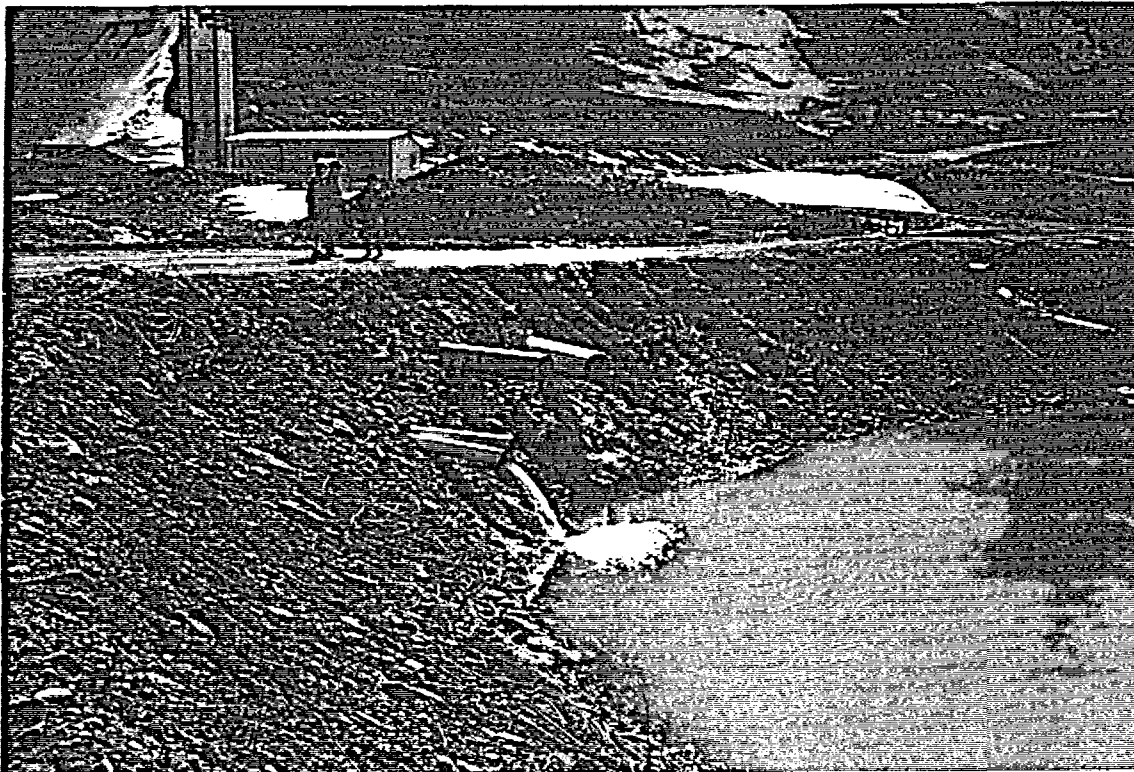


PHOTO 8

Photo facing east-southeast of plugged conduits and one open conduit discharging into the primary settling pond. Note erosion where water is overflowing from upper surface water impoundment (RS-SW-1) to the right of the non-flowing conduits.

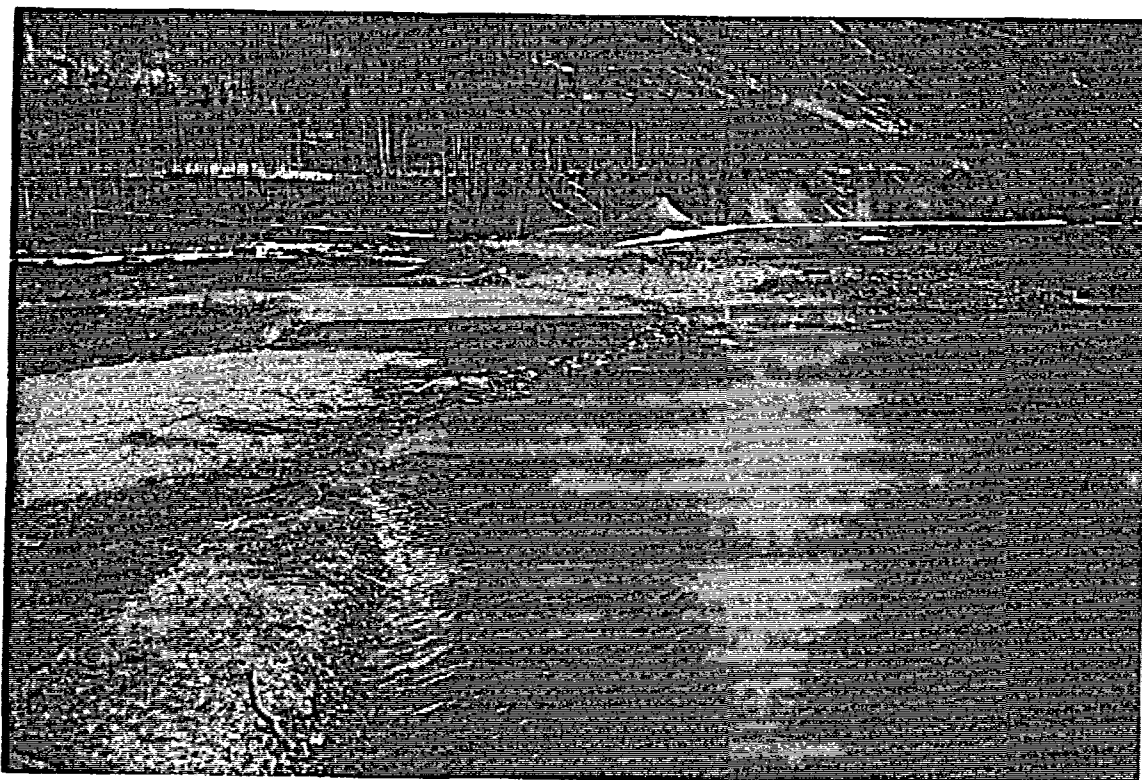


PHOTO 9

Photo facing north-northwest of upper surface water impoundment. Note overflow from right to left across berm/road into primary settling pond.



PHOTO 10

Photo facing west of surface water overflowing from upper surface water impoundment into the primary settling pond.

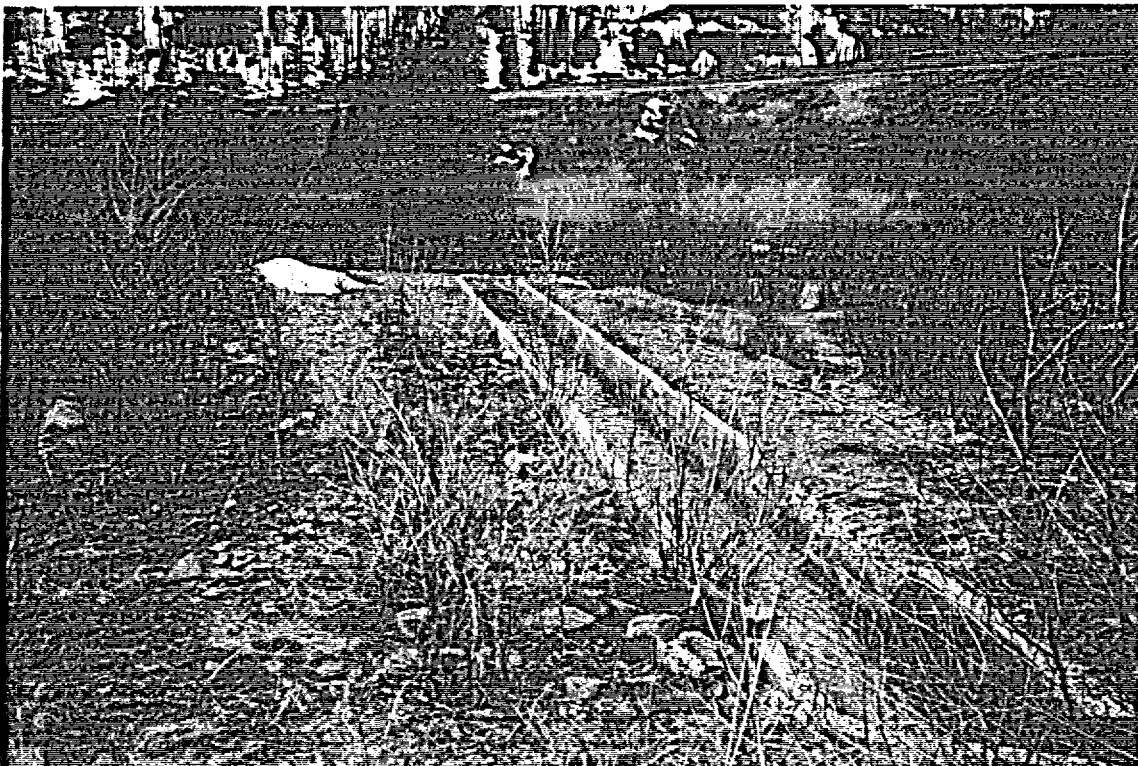


PHOTO 11

Photo facing southwest of surface water flowing from NPDES discharge pond into the Dolores River.

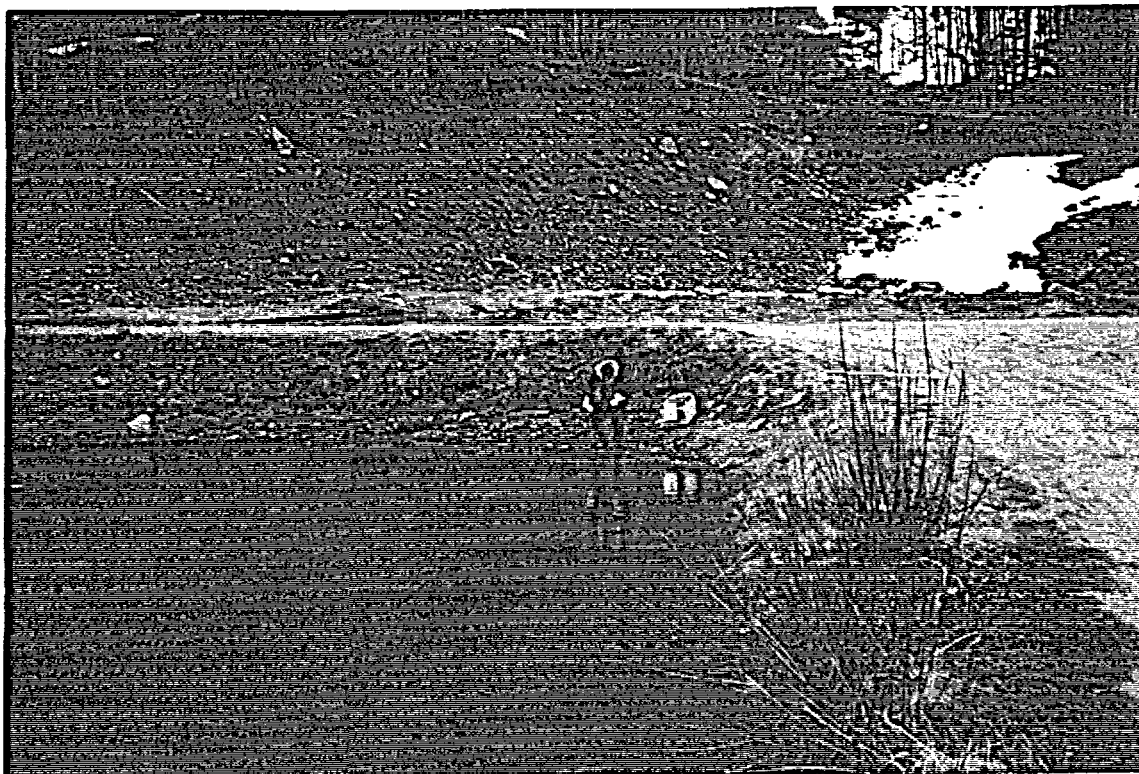


PHOTO 12

Photo facing east of START member conducting surface water sampling at NPDES discharge pond (RS-SW-5).

APPENDIX B

Sampling and Analysis Plan (SAP)

Sampling and Analysis Plan
for the
Environmental Protection Agency
Emergency Response Program



Sampling and Analysis Plan for the Environmental Protection Agency Emergency Response Program

Project Name: Rico Town Pond Site

U.S. EPA Project Number: 0004-0010

Contractor Project Number: 75-F0000410

U.S. EPA Contract Number: 68-W5-0031 EPA Region VIII

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OVERVIEW

This template provides a format for preparing a Sampling and Analysis Plan (SAP) under emergency response or opportunity sampling conditions. This SAP template, when completed, provides a complete description of a site or facility and includes information about sample collection activities and quality assurance. Changes in site conditions and/or direction from the U.S. Environmental Protection Agency (EPA) On-Scene Coordinator (OSC), that cause a departure from this SAP, must be noted in the field log book and project reports.

Use this template only when there is (1) less than 24 hours before the sampling occurs or (2) when the OSC anticipates that the site and/or emergency action will be non-complex, less than one acre in size, and require collection of less than 15 samples total. Write a standard SAP if this is not an emergency, if all of the above conditions can not or will not be met, or if conditions change during the course of the sampling.

This SAP template is organized according to EPA guidance. The guidance specifies that a QAPP must contain twenty-five elements (sixteen for Region VIII). The SAP template conforms to this guidance and contains information regarding site location/description, site history, project objectives, sampling design, sample collection and analysis, project organization/schedule, and project quality assurance.

A completed SAP template provides the site-specific quality assurance information that is used in conjunction with the EPA Emergency Response Program (ERP) Generic Quality Assurance Project Plan (QAPP) to satisfy the requirements of EPA Order 5360.1 "Policy and Program Requirements to Implement the Mandatory Quality Assurance Program". Order 5360.1 states that all environmental data collection activities, that are performed by or on behalf of the EPA, must be supported by an approved QAPP. The QAPP must be completed and approved prior to the start of data collection activities, except as specified by Region VIII emergency response/time-critical removal policies. The ERP Generic QAPP provides quality assurance information that is common to all sampling activities. The SAP provides quality assurance information that is unique to a site.

This SAP template was prepared by URS Operating Services, Inc. (UOS) for the Region VIII Emergency Response Program (ERP) as a part of the Superfund Technical Assessment & Response Team (START) program. START is executed under Contract No. 68-W5-0031 for the EPA in Region VIII. The generic QAPP and site-specific SAP template were prepared in accordance with the EPA guidance document entitled, "EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations, Draft Interim Final EPA QA/R-5" and "Quality Assurance/Quality Control Guidance for Removal Activities" (EPA 1990). The ERP generic QAPP is supplemented by this project-specific SAP template, Standard Operating Procedures (SOPs) and a Site Health and Safety Plan.

1.0 LOCATION AND GEOGRAPHY OF SITE/FACILITY

Site/Facility Name: Rico Town Pond/St. Louis Tunnel Mine and Mill Site

Street Address: Highway 145, 1 mile north of Rico, Colorado

City: Colorado Springs County: Delta State: Colorado Zip Code:

Latitude: _____ Longitude: _____ Section: 24 and 25 Township: 40 North Range: 11 West
____° ____' ____" ____° ____' ____"

Approximate Area of Site: 10 Acres _____ Square Feet

General Topography:

Nearest Residences are located within 1 mi to the S and E.

2.0 OWNER/OPERATOR OF SITE/FACILITY

Owner: Rico Properties, Inc.

Operator: Unknown

Street Address: Same as above

Street Address: _____

City: _____

City: _____

State: _____ Zip Code: _____

State: _____ Zip Code: _____

Telephone: none

Telephone: _____

Type of Ownership:

<input type="checkbox"/> Unknown	<input type="checkbox"/> State	<input type="checkbox"/> Municipality
<input checked="" type="checkbox"/> Private	<input type="checkbox"/> County	<input type="checkbox"/> Federal Agency
<input type="checkbox"/> _____		

3.0 NAME OF EPA AND/OR STATE AGENCY CONTACT

EPA Contact: Tien Nguyen

State Contact: N/A

Street Address: 999 18th Street

Street Address: _____

City: Denver

City: _____

State: CO Zip Code: 80202

State: _____ Zip Code: _____

Telephone: 303.312.6820

Telephone: _____

4.0 HISTORY AND DESCRIPTION OF SITE/FACILITY

Years of Operation: _____ ✓ Unknown

Beginning year _____ Ending Year _____ Abandoned Since _____

Status of Site:

☐ Unknown ☐ Active ☒ Inactive ☐ NA (GW plume, etc.)

Predominant Land Uses Within One Mile of Site (Check all that apply):

<input type="checkbox"/> Unknown	<input type="checkbox"/> Recreational	<input checked="" type="checkbox"/> State/National Forest
<input type="checkbox"/> Industrial	<input checked="" type="checkbox"/> Mining	<input type="checkbox"/> State/National Park
<input type="checkbox"/> Commercial	<input type="checkbox"/> Agricultural	_____
<input checked="" type="checkbox"/> Residential	<input type="checkbox"/> Logging	_____

Site Setting: ☐ Unknown ☐ Urban ☐ Suburban ☒ Rural

Previous Investigations/Assessments/Permit Violations:

☐ Unknown ☐ No ☒ Yes - Type _____

Distance to closest domestic or municipal well(s): Unknown _____

Distance to closest surface water: 100 feet _____

Distance to closest water intake(s): unknown 100 feet _____

Facility Type / Site Operations (Check all that apply):

<input type="checkbox"/> Unknown	<input type="checkbox"/> Chemical Manufacturing
<input type="checkbox"/> Private Residence/Neighborhood	<input type="checkbox"/> Petrochemical Manufacturing
<input type="checkbox"/> Dry Cleaning Facility	<input type="checkbox"/> Paint and Varnish Manufacturing
<input type="checkbox"/> Retail Gasoline Station	<input type="checkbox"/> Electronic Equipment Manufacturing
<input checked="" type="checkbox"/> Mining	<input type="checkbox"/> Agricultural Chemicals Manufacturing
<input type="checkbox"/> Metal Forging or Stamping	<input type="checkbox"/> Plastic and Rubber Products Manufacturing
<input type="checkbox"/> Metal Coating, Plating or Engraving	<input type="checkbox"/> Lumber and Wood Products Manufacturing
<input type="checkbox"/> Refinery	<input type="checkbox"/> Other Manufacturing
<input type="checkbox"/> Tannery	<input type="checkbox"/> Landfill
<input type="checkbox"/> Battery Reclamation	<input type="checkbox"/> Incinerator/Smelter
<input type="checkbox"/> Drum Recycling/Disposal	<input type="checkbox"/> Treatment, Storage, or Disposal
<input type="checkbox"/> Federal Facility	<input type="checkbox"/> Junk/Salvage Yard
<input type="checkbox"/> _____	<input type="checkbox"/> _____

The basis for the site information is: ☐ Site maps ☐ Geological information ☐ Disposal records
☐ Photos ☒ Historical data ☐ State investigation ☐ Federal investigation
☒ Personal interviews ☐

5.0 LOCATION, CHARACTERISTICS AND EXTENT OF WASTE

Where is the waste located?: (Check all that apply)

- | | | |
|--|---|--|
| <input type="checkbox"/> Unknown | <input type="checkbox"/> Vats | <input type="checkbox"/> Buildings |
| <input type="checkbox"/> Contaminated Soil | <input checked="" type="checkbox"/> Drums | <input type="checkbox"/> Storage Areas |
| <input checked="" type="checkbox"/> Contaminated Surface Water/Sediment (identified source) <input type="checkbox"/> | <input type="checkbox"/> Landfill | <input type="checkbox"/> Process Areas |
| <input type="checkbox"/> Contaminated Groundwater Plume (identified/unidentified source) <input type="checkbox"/> | <input type="checkbox"/> Tailings Pile <input type="checkbox"/> | <input type="checkbox"/> Laboratory |
| <input type="checkbox"/> Wetlands | <input checked="" type="checkbox"/> Surface Impoundment | |
| <input type="checkbox"/> Storm Water Ponds | <input type="checkbox"/> Trash Pile (open dump) | |
| <input type="checkbox"/> Wastewater Ponds | <input type="checkbox"/> Scrap Metal or Junk Pile | |
| <input type="checkbox"/> Lagoons | <input type="checkbox"/> Chemical Waste Pile | |
| <input type="checkbox"/> Drainage Ditches | <input type="checkbox"/> Land Treatment Area | |
| <input type="checkbox"/> Tanks and Non-Drum Containers | <input type="checkbox"/> Railroad Tracks | |
| <input type="checkbox"/> Underground Tanks | <input type="checkbox"/> Roads / Access Ways | |
| <input type="checkbox"/> | <input type="checkbox"/> Injection Wells | |
| <input type="checkbox"/> | <input type="checkbox"/> | |
| <input type="checkbox"/> | <input type="checkbox"/> | |

What types of materials were handled at the site? (Check all that apply)

- | | | |
|--|--|--|
| <input type="checkbox"/> Unknown | <input type="checkbox"/> Organics | <input type="checkbox"/> Laboratory/Hospital Waste |
| <input checked="" type="checkbox"/> Acids | <input type="checkbox"/> Pesticides/Herbicides | <input type="checkbox"/> Construction/Demolition Waste |
| <input type="checkbox"/> Bases | <input type="checkbox"/> Oily Waste | <input type="checkbox"/> Radioactive Waste |
| <input checked="" type="checkbox"/> Solvents | <input type="checkbox"/> Petroleum Products | <input checked="" type="checkbox"/> Mine Waste |
| <input type="checkbox"/> Inorganics | <input type="checkbox"/> Paint/Pigments | <input type="checkbox"/> Municipal Waste |
| <input checked="" type="checkbox"/> Metals | <input type="checkbox"/> Explosives | <input type="checkbox"/> |

What is the physical state of the waste as deposited? (Check all that apply)

- ☐ Solid ☒ Sludge ☐ Powder ☒ Liquid ☐ Gas ☐

What are the contaminants of concern?

(Contaminants)

(Concentration Range)

Arsenic, Cadmium, Chromium, Lead

What is the quantity or extent (i.e., area) of the contamination (estimate)? unknown

What is the physical/chemical threat to the population at risk? unknown

Use this grid to make a sketch of the site and identify the locations where you expect to collect samples. Include a direction arrow (e.g. north) and approximate scale or distance from identifiable features. Also include streams, drains, wells, ditches, roads, buildings, underground lines (when known).

A grid of graph paper with a central rectangular area labeled "Refer to Site Map". The grid is composed of 20 columns and 20 rows of squares. The central area is a rectangle that is 8 squares wide and 4 squares high, centered within the grid. The text "Refer to Site Map" is written in a bold, black, sans-serif font, centered within the central rectangle.

Rico Town Pond - ER Sampling and Analysis Plan
Revision: 3
Date: 04/2000
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This image shows a full page of blank graph paper. The grid consists of small, equal-sized squares formed by thin black lines. There are 20 columns and 20 rows of squares, creating a total of 400 square units. The paper is otherwise completely blank, with no margins, text, or other markings.

6.0 PROJECT OBJECTIVES

6.1 Project Stage

- ☐ Early Assessment ☐ _____
☐ Cleanup Attainment ☐ _____
☒ Emergency Response _____

6.2 Project Scope

What is the purpose of this sampling effort? Identify presence of heavy metals in sediment and surface water samples related to settling pond overflow into Dolores creek.

What are the regulatory objectives (e.g. NPDES, Superfund)? NPDES/Superfund

What are the action levels for contaminants of concern? Chemical specific (TBD)

What work is involved? Sample collection

How will the planned activities resolve the problem? Provide definitive evidence of discharge contamination (heavy metals) related to settling pond overflow. If release of heavy metals from settling pond has occurred then an emergency repair of pond banks and discharge could occur.

Who are the intended users of the analytical data? EPA

What will the sample analytical data be used for? Mitigation/cleanup determination

Who are the decision makers? EPA

What are the project limitations (e.g., time, budget)? Time

6.3	Sampling Objective. What are the sample collection objectives and the data types (S, S/D, D) that apply to this project? (Check all that apply, and note data type)	Data Type*
<input type="checkbox"/>	Assess health and safety for worker protection	
<input checked="" type="checkbox"/>	Determine general physical or chemical properties/sources	D
<input type="checkbox"/>	Delineate plume in groundwater	D
<input type="checkbox"/>	Identify hot spots	D
<input type="checkbox"/>	Identify sources	D
<input checked="" type="checkbox"/>	Determine extent of contamination	D
<input checked="" type="checkbox"/>	Identify migration pathways	D
<input checked="" type="checkbox"/>	Identify transport mechanisms	D
<input checked="" type="checkbox"/>	Document observed release	
<input checked="" type="checkbox"/>	Identify contaminants	D
<input type="checkbox"/>	Determine treatment and disposal options	
<input checked="" type="checkbox"/>	Determine threat to humans	D
<input checked="" type="checkbox"/>	Determine threat to environment	D
<input checked="" type="checkbox"/>	Determine background	
<input type="checkbox"/>	Verify cleanup	
<input checked="" type="checkbox"/>	Quantify contamination	D
<input type="checkbox"/>	Compare to benchmark	
<input checked="" type="checkbox"/>	Emergency response	D
<input checked="" type="checkbox"/>	Determine presence of contamination	D

* **Data Type:** The following notes summarize EPA Superfund data types. For a more complete description refer to Attachment 1.

S = Screening Data: Screening data are generated by rapid, less precise methods of analysis and less rigorous sample preparation. Sample preparation steps may be restricted to simple procedures such as dilution with a solvent, instead of elaborate extraction/digestion and cleanup. Screening data provide analyte identification and quantification, although the quantification may be relatively imprecise. Screening data without associated confirmation data are not considered to be data of known quality. (Refer to ERP Generic QAPP Section 5.1.1.)

S/D = Screening Data with 10% Definitive Confirmation: At least 10% of the screening data are confirmed using analytical methods and QA/QC procedures and criteria associated with definitive data. As a minimum, at least three screening samples reported above the action level (if any) and three screening samples reported below the action level (or as non-detects) should be randomly selected from the appropriate group and confirmed. Analytical error determination is required unless total measurement error is determined during the confirmation analyses. (Refer to ERP Generic QAPP Section 5.1.2.)

D = Definitive Data: Definitive data are generated using rigorous analytical methods, such as approved EPA reference methods. Data are analyte-specific, with confirmation of analyte identity and concentration. Methods produce tangible raw data (e.g., chromatograms, spectra, digital values) in the form of paper printouts or computer-generated electronic files. Data may be generated at the site or at an off-site location, as long as the QA/QC requirements are satisfied. For the data to be definitive, either analytical or total measurement error must be determined. (Refer to ERP Generic QAPP Section 5.1.3.)

The following sections summarize the sampling design. Match the number for the “Matrix Type” with the “Required Analyses,” in Section 7.1 and with the “Sampling Approach” in Section 7.2.

Air	Water	Liquid Waste	Soil/Sediment/Solids
1 Ambient air	1 Domestic Wells	1 Petroleum Products	1 Soil
2 Emissions	2 Tap Water	2 Drum Liquid	2 Drum Solid
3 Soil gas	3 Groundwater	3 Tank Liquid	3 Tank Solid
4 _____	4 Surface Water	4 Waste Material	4 Waste Material
5 _____	5 _____	5 _____	5 Sediment
6 _____	6 _____	6 _____	6 _____

[illegible]

7.2 Sampling Approach: Put the number for each matrix type (from the list above) next to the corresponding sampling approach for that matrix.

Air	Water	Liquid Waste	Soil/Sediment/Solids
___ Judgmental ___ Worst Case (Air Only) ___ Search (hot spots) ___ Composite (explain below) _____ _____ _____ _____ _____ _____ _____ _____ _____	3 Judgmental Search (hot spots) ___ Composite (explain below) _____ _____ _____ _____ Samples will be composited as follows: _____ _____ _____ _____ _____	Judgmental Search (hot spots) Composite (explain below) _____ _____ _____ _____ Samples will be composited as follows: _____ _____ _____ _____ _____	5 Judgmental Search (hot spots) ___ Composite (explain below) _____ _____ _____ _____ Samples will be composited as follows: _____ _____ _____ _____ _____

7.3 What is the justification for this sampling approach?

<input checked="" type="checkbox"/> Directive of OSC <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____
--

8.0 SAMPLE COLLECTION AND ANALYSIS

The following sections summarize sample collection and analysis: Section 8.1 "Sampling Locations and Sample Quantity," Section 8.2 "Sampling Equipment," Section 8.3 "Sampling Equipment Fabrication," Section 8.4 "Equipment Decontamination," Section 8.5 "Support Vehicle/Facilities/Phones Required," Section 8.6 "Disposal of Investigation-Derived Waste," Section 8.7 Analytical Methods, Sample Containers, Sample Preservation, and Holding," and Section 8.8 Quality Assurance Objectives."

8.1 SAMPLE IDENTIFICATION AND QUANTITY

TABLE 1
Sample Identification and Quantity

Sample ID / Location	Analysis						Quality Control Samples							Total Samples
							Lab QC			Field QC				
	VOA	TCLP VOA	Total Metals	TCLP Metals	RCI	Glycol	Standard Reference Samples	MS/MSD	Other..	Field Replicates	Trip Blanks	Field Blank	Equipment Rinsate	
RS-SW-1			X											3
RS-SE-1			X											2
RS-SW-2			X											3
RS-SE-2			X											2
RS-SW-3			X					X						3
RS-SE-3			X					X						2
RS-SW-4			X											3
RS-SE-4			X											2
RS-SW-5			X											3
RS-SE-5			X											2
RS-SW-6			X							X				3
RS-SE-6			X							X				2

- 1 Standard Reference samples: QC Samples of known concentration shipped to the laboratory with the field samples.
- 2 MS/MSD = 1 per matrix per 20 samples. Choose the cleanest sample, but not a blank.
- 3 Field Replicates (collocated samples) = 1 per matrix per 20 samples. Choose the cleanest sample, but not a blank.
- 4 Trip Blanks = 1 per shipment (generally only for VOC).
- 5 Field Blank = 1 per matrix per 20 samples (generally only for VOC).
- 6 Equipment Rinsate = 1 per matrix per 20 samples (for non-disposable equipment).

8.2 Sampling Equipment

Air	Water	Liquid Waste	Soil/Sediments/Solids
a 0.8 um Filter (MCE)	a Bacon Bomb	a Bacon Bomb	a Auger
b 0.8-1.2 um, 25 mm Filter	b 3 Bailer	b Bailer	b Backhoe
c 37 mm, 5 um PVC Filter	c Bladder Pump	c Peristaltic Pump	c Bucket Auger
d Bubbler	d Peristaltic Pump	d Dip Sampler	d Chisel
e Charcoal Tube	e Dip Sampler	e Drum Thief	e Eckman/Ponar Dredge
f Filter and Impinger	f Drum Thief	f Kemmerer Bottle	f Electric Hammer
g Florisil Tube	g Kemmerer Bottle	g Sample Bottle	g Geoprobe Soil Core
h Glass Fiber Filter	h 3 Sample Bottle	h COLIWASA	h Sampling Treir
i Polyurethane Foam Filter	i COLIWASA	i	i 5 Scoop
j Silica Gel Tube	j Geoprobe	j	j Shelby Tube
k Solid Sorbent Tube	k Piezometer	k	k Shovel
l Summa Canister	l	l	l Slam Bar Soil Core
m Tedlar Bag	m	m	m Sludge Judge
n Tenax Tube	n	n	n Soil Coring Device
o XAD-2 Tubes	o	o	o Spatula
p	p	p	p Split Spoon
			q Thin-Wall Tube Sampler
			r Trowel
			s

8.3 Sampling Equipment Fabrication.

Air	Water	Liquid Waste	Soil/Sediments/Solids
Fiberglass Filter	Carbon steel/ Stainless steel	Carbon steel/ Stainless steel	Carbon steel/Stainless steel
Glass	Teflon (PTFE)	Teflon (PTFE)	Teflon (PTFE)
Carbon steel/stainless steel	Glass	Glass	Glass
	Plastic/PVC	Plastic/PVC	5 Plastic/PVC
	3 Plastic/polyethylene/HPDE	Plastic/polyethylene/HPDE	Plastic/polyethylene/HPDE

8.4 Equipment Decontamination Steps (for non-dedicated equipment)

Air	Water	Liquid Waste	Soil/Sediments/Solids
Physical removal	b Physical removal	Physical removal	i Physical removal
Non-phosphate detergent wash	Non-phosphate detergent wash	Non-phosphate detergent wash	Non-phosphate detergent wash
Potable water rinse	Potable water rinse	Potable water rinse	Potable water rinse
10% nitric acid rinse	10% nitric acid rinse	10% nitric acid rinse	10% nitric acid rinse
Hexane rinse	Hexane rinse	Hexane rinse	Hexane rinse
Methylene chloride rinse	Methylene chloride rinse	Methylene chloride rinse	Methylene chloride rinse
Pesticide grade acetone rinse	Pesticide grade acetone rinse	Pesticide grade acetone rinse	Pesticide grade acetone rinse
Distilled/deionized water rinse	Distilled/deionized water rinse	Distilled/deionized water rinse	Distilled/deionized water rinse
Organic free water rinse	Organic free water rinse	Organic free water rinse	Organic free water rinse
Air dry	Air dry	Air dry	Air dry
Cover with	Cover with	Cover with	Cover with

8.5 Support Vehicles/Facilities/Phones:

What supporting equipment will be required and who is responsible for providing it (e.g., EPA, START)?

- | | |
|---|---|
| <input checked="" type="checkbox"/> Emergency Response Vehicle_____ | <input checked="" type="checkbox"/> Cell Phone_____ |
| <input type="checkbox"/> Trailer_____ | <input type="checkbox"/> Global Positioning System (GPS)_____ |
| <input type="checkbox"/> Geoprobe_____ | <input type="checkbox"/> _____ |
| <input type="checkbox"/> Drill Rig_____ | <input type="checkbox"/> _____ |
| <input type="checkbox"/> _____ | |
| <input type="checkbox"/> _____ | |

8.6 Disposal of Investigation-Derived Wastes (IDW)

- ☐ No IDW will be generated.
- ☒ IDW will be containerized and characterized for appropriate disposal.
- ☒ IDW will be placed on site in an approved location.
- ☐ _____
- ☐ _____

8.7 Analytical Methods, Sample Containers, Sample Preservation, and Holding Times

TABLE 2
Analytical Methods, Sample Containers, Sample Preservation, Holding Times

Analysis	Analytical Method Number	Method Reference	Container Number and Type ¹	Required Volume	Preservation ²	Technical Holding Time ³
Total Metals	6010B, 7060A, 7421, 7471, 7470, 7740, 7841	SW-846	1 HPDE	4 oz.	4 degrees C, HNO3 pH<2	6 months

- 1 Recommended container types: AGV = amber glass vial; HDPE = high-density polyethylene bottle and cap; AGB = amber glass bottle.
- 2 Preserve the samples as soon as you collect them. Add preservatives to filtered samples following filtration. Completely fill containers used for volatile organic samples, permitting no head space.
- 3 Technical holding time is the time interval from sample collection until sample analysis (or until sample extraction for semivolatile compounds). Technical holding times are determined by method and by matrix.

8.8 Quality Assurance Objectives

TABLE 3
Quality Assurance Objectives

Analysis (for each matrix)	Analytical Method ¹	Data Type ³	Units	Required Detection Limits ²	Accuracy ⁴ % Recovery	Precision ⁴ ±%
Total Metals (Aqueous)	6010B, 7060A, 7421, 7471, 7470, 7740, 7841	D	µg/L	0.0002-5.0	75-125	± 20

Analysis	Water (% Recovery)	Soil (% Recovery)	Water (RPD)	Soil (RPD)
Metals	75-125	50-120	20	± 35%

1 The specified analytical method contains the complete list of analytes determined from an analysis.

2 Detection limit, accuracy, and precision values are presented in this table as ranges. The values are based on method specifications

and on project data quality objectives. Use a * to indicate site-specific DQOs that differ from method specifications.

3 Data type refers to the following:

S = Screening

S/D = Screening with 10% Definitive data

D = Definitive Confirmation

4 Accuracy is determined by use of field blind QC samples and laboratory matrix spikes. Precision is determined by use of field duplicates, laboratory duplicates, and laboratory matrix spike duplicates.

ATTACHMENT 1 Superfund Data Categories

QA/QC Levels ¹	Screening	Screening with 10% Definitive Confirmation	Definitive
Data Uses ¹	Data useful only for immediate situation; and to afford a quick, preliminary assessment of site contamination.	Data useful for site assessment and decision making at OSC discretion	Data useful for enforcement, litigation, risk assessment, and most other uses
Typical Uses	<ul style="list-style-type: none"> • Preliminary health and safety assessment • Preliminary identification and quantitation of pollutants • Non-critical decisions • Emergency situations • Waste profiling 	<ul style="list-style-type: none"> • Site characterization • Waste characterization • Clean-up confirmation • Verification of health and safety assessment • Verification of critical samples 	<ul style="list-style-type: none"> • Enforcement • Litigation • Risk assessment
Quality Assurance Type	Data of <u>Unknown</u> Quality	Data of <u>known</u> quality	Data of <u>known</u> quality
Quality Assurance Elements	<ul style="list-style-type: none"> • Logged quality control checks • Qualified analyst 	<ul style="list-style-type: none"> • Identification • Quantification • Confirmation of 10% of the samples by a definitive method • Error determination² 	<ul style="list-style-type: none"> • Definitive identification • Definitive quantification • Error determination
Validation	None	QC Review ³	Validation of 10% of the results in each of the samples, calibrations, and QC analyses
Quality Control Elements	<ul style="list-style-type: none"> • Instrument QC • Field QC • Analyst training • Document DLs (Field blanks and collocated samples are not required) 	<ul style="list-style-type: none"> • Instrument QC • Field QC • Analyst training • QC within method parameters • Document DLs 	<ul style="list-style-type: none"> • Instrument QC • Field QC • Analyst training • QC within method parameters • Document DLs
Sampling Plan	Optional	Mandatory	Mandatory

¹QA/QC levels: Screening is equivalent to QA1; Screening with Definitive Confirmation is similar to QA2 (see footnote 2), and Definitive is similar to QA3. The difference between Definitive and QA3 is found in determination of error, where QA3 requires collection and analysis of eight replicate samples, and Definitive requires analysis of an appropriate number of replicate or collocated samples.

²Error determination: Screening with Definitive Confirmation requires measurement of analytical error (screening sample replicates) unless total measurement error (collocated samples) is determined during the confirmation analyses. Error determination is optional for QA2. The site-specific SAP may state that error determination is not necessary if it can be qualitatively shown that the DQOs do not require it, e.g., concentrations in the percent range are expected to be found, yet the action level is in the ppb range.

³QC review is required for all samples analyzed under Screening with 10% Definitive Confirmation. Data validation is required for the Definitive Confirmation data.

ATTACHMENT 1 Superfund Data Categories

QA/QC Levels ¹	Screening	Screening with 10% Definitive Confirmation	Definitive
Typical Volatile Analyses	<ul style="list-style-type: none"> Field GC (e.g., Sentex field GC with single column and detector) 	<ul style="list-style-type: none"> Field GC with 10% of samples being confirmed by GC/MS with full QA/QC deliverables; duplicates and blanks. 	<ul style="list-style-type: none"> EPA Method 8240 or 8260; data package; replicates; blanks and spikes
Typical Volatile Analyses (continued)	<ul style="list-style-type: none"> Field GC (continued) 	<ul style="list-style-type: none"> GC method with 10% of samples being confirmed by GC/MS with full QA/QC deliverables; duplicates and blanks. 	<ul style="list-style-type: none"> EPA Method 8010/ 8020 with second column confirmation; data package replicate, blanks, and spikes.
Typical Non-volatile Analyses	<ul style="list-style-type: none"> Immunoassay kits 	<ul style="list-style-type: none"> Immunoassay with 10% of samples being confirmed by GC/MS with full QA/QC deliverables; duplicates and blanks. 	<ul style="list-style-type: none"> EPA Method 8270; data package; replicates, blanks, and spikes.
		<ul style="list-style-type: none"> GC method with 10% of samples being confirmed by GC/MS with full QA/QC deliverables; duplicates and blanks. 	<ul style="list-style-type: none"> EPA Method 8100/ 8120 with second column confirmation; data package; replicate, blanks, and spikes.
Typical Metal Analyses	<ul style="list-style-type: none"> Field XRF 	<ul style="list-style-type: none"> Field XRF with 10% of samples being confirmed by ICP or AA with full QA/QC deliverables; duplicates and blanks. 	<ul style="list-style-type: none"> EPA Method 6010; data package; replicates, blanks, and spikes.
		<ul style="list-style-type: none"> AA, ICP, IC, or wet chemistry methods with 10% of samples being confirmed by ICP or AA with full QA/QC deliverables; duplicates and blanks. 	<ul style="list-style-type: none"> EPA methods for AA (7000s); data package; replicate, blanks, and spikes.

ATTACHMENT 1
Superfund Data Categories
 (continued)

QA/QC Levels ¹	Screening	Screening with 10% Definitive Confirmation	Definitive
Typical PCB/ Pesticide Analyses	• Immunoassay Kits	• Immunoassay kits ⁴ with 10% of samples being confirmed by GC/MS with full QA/QC deliverables; duplicates and blanks.	• EPA Method 8140-Pesticides; data package; replicates, blanks, and spikes.
		• GC method with 10% of samples being confirmed by GC on a second column with full QA/QC deliverables; duplicates and blanks.	• EPA Method 8080 with second column confirmation; data package; replicate, blanks, and spikes.
Typical Petroleum Hydrocarbon Analyses	• Immunoassay kits • Chem test kits (HANBY) • IR (EPA 413 and 418) methods	• Immunoassay ⁴ , IR, and chemical analysis with 10% of samples being confirmed by GC/MS or EPA Method 8015 (modified) with second column confirmation with full QA/QC deliverables; duplicates and blanks.	• EPA Method 8015 (modified) with second column confirmation; data package; replicate, blanks, and spikes.
		• GC method with 10% of samples being confirmed by GC/MS or GC on two columns with full QA/QC deliverables; duplicates and blanks.	
Testing for physical parameters is not analyte specific. Therefore, by strict definition, any physical test would have to be considered non-definitive. However, the testing methods may be definitive if approved methodology is followed.			
Physical Parameters (pH, flash point, etc.)	• Field testing equipment	• Testing equipment with QC samples, duplicates, and blanks.	• Testing equipment; data package; and QC samples, duplicates, and blanks.

⁴Immunoassay kits used to generate data must be capable of generating calibration, blank, duplicate, and estimation of error data.

APPENDIX C

Laboratory Analytical Results and Chain-of-Custody Forms

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

RS-SW-1

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: Q1241_

Matrix (soil/water): WATER

Lab Sample ID: Q1241-1

Level (low/med): LOW_

Date Received: 04/15/00

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	339	—	—	P
7440-36-0	Antimony	2.1	U	—	P
7440-38-2	Arsenic	2.3	U	—	P
7440-39-3	Barium	25.2	—	—	P
7440-41-7	Beryllium	0.88	B	—	P
7440-43-9	Cadmium	21.5	—	—	P
7440-70-2	Calcium	250000	—	—	P
7440-47-3	Chromium	0.40	U	—	P
7440-48-4	Cobalt	4.0	B	—	P
7440-50-8	Copper	42.7	—	—	P
7439-89-6	Iron	6080	—	—	P
7439-92-1	Lead	4.8	—	—	P
7439-95-4	Magnesium	20600	—	—	P
7439-96-5	Manganese	2100	—	—	P
7439-97-6	Mercury	0.13	B	—	CV
7440-02-0	Nickel	7.3	—	—	P
7440-09-7	Potassium	1810	—	—	P
7782-49-2	Selenium	2.2	U	N	P
7440-22-4	Silver	0.60	U	—	P
7440-23-5	Sodium	13000	—	—	P
7440-28-0	Thallium	3.2	U	—	P
7440-62-2	Vanadium	0.81	B	—	P
7440-66-6	Zinc	4490	—	—	P
—	—	—	—	—	—
—	—	—	—	—	—

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: YELLOW_ Clarity After: CLEAR_ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

RS-SW-2

Lab Name: COMPUCHEM _____ Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: Q1241_

Matrix (soil/water): WATER

Lab Sample ID: Q1241-2

Level (low/med): LOW__

Date Received: 04/15/00

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L__

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	264	-		P
7440-36-0	Antimony	2.1	U		P
7440-38-2	Arsenic	2.3	U		P
7440-39-3	Barium	24.1			P
7440-41-7	Beryllium	0.58	B		P
7440-43-9	Cadmium	17.4			P
7440-70-2	Calcium	245000			P
7440-47-3	Chromium	0.40	U		P
7440-48-4	Cobalt	3.2	B		P
7440-50-8	Copper	27.0			P
7439-89-6	Iron	2600			P
7439-92-1	Lead	10.7			P
7439-95-4	Magnesium	20900			P
7439-96-5	Manganese	1900			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	5.5			P
7440-09-7	Potassium	1810			P
7782-49-2	Selenium	2.2	U	N	P
7440-22-4	Silver	0.60	U		P
7440-23-5	Sodium	11800			P
7440-28-0	Thallium	3.2	U		P
7440-62-2	Vanadium	0.40	U		P
7440-66-6	Zinc	3570			P

Color Before: COLORLESS Clarity Before: CLEAR__ Texture: _____

Color After: YELLOW__ Clarity After: CLEAR__ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

RS-SW-3

Lab Name: COMPUCHEM

Contract: _____

Lab Code: LIBRTY

Case No.: _____

SAS No.: _____

SDG No.: Q1241_

Matrix (soil/water): WATER

Lab Sample ID: Q1241-3

Level (low/med): LOW

Date Received: 04/15/00

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	300	-		P
7440-36-0	Antimony	2.1	U		P
7440-38-2	Arsenic	2.3	U		P
7440-39-3	Barium	71.1			P
7440-41-7	Beryllium	0.24	B		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	33100			P
7440-47-3	Chromium	0.40	U		P
7440-48-4	Cobalt	0.50	U		P
7440-50-8	Copper	0.60	U		P
7439-89-6	Iron	277			P
7439-92-1	Lead	1.3	U		P
7439-95-4	Magnesium	5180	-		P
7439-96-5	Manganese	46.4			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	1.1	B		P
7440-09-7	Potassium	792	B		P
7782-49-2	Selenium	2.2	U	N	P
7440-22-4	Silver	0.60	U		P
7440-23-5	Sodium	2480			P
7440-28-0	Thallium	3.2	U		P
7440-62-2	Vanadium	0.64	B		P
7440-66-6	Zinc	2.6	B		P

Color Before: COLORLESS

Clarity Before: CLEAR

Texture: _____

Color After: YELLOW

Clarity After: CLEAR

Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

RS-SW-4

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: Q1241_

Matrix (soil/water): WATER

Lab Sample ID: Q1241-4

Level (low/med): LOW

Date Received: 04/15/00

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	334	—	—	P
7440-36-0	Antimony	2.1	U	—	P
7440-38-2	Arsenic	2.3	U	—	P
7440-39-3	Barium	72.8	—	—	P
7440-41-7	Beryllium	0.28	B	—	P
7440-43-9	Cadmium	0.20	U	—	P
7440-70-2	Calcium	32000	—	—	P
7440-47-3	Chromium	0.40	U	—	P
7440-48-4	Cobalt	0.50	U	—	P
7440-50-8	Copper	0.60	U	—	P
7439-89-6	Iron	276	—	—	P
7439-92-1	Lead	1.3	U	—	P
7439-95-4	Magnesium	5110	—	—	P
7439-96-5	Manganese	27.9	—	—	P
7439-97-6	Mercury	0.12	B	—	CV
7440-02-0	Nickel	0.75	B	—	P
7440-09-7	Potassium	801	B	—	P
7782-49-2	Selenium	2.2	U	N	P
7440-22-4	Silver	0.60	U	—	P
7440-23-5	Sodium	2470	—	—	P
7440-28-0	Thallium	3.2	U	—	P
7440-62-2	Vanadium	0.67	B	—	P
7440-66-6	Zinc	1.4	B	—	P
			—	—	—

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

RS-SW-5

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: Q1241_

Matrix (soil/water): WATER

Lab Sample ID: Q1241-5

Level (low/med): LOW_

Date Received: 04/15/00

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	46.6	B		P
7440-36-0	Antimony	2.1	U		P
7440-38-2	Arsenic	2.3	U		P
7440-39-3	Barium	20.9			P
7440-41-7	Beryllium	0.32	B		P
7440-43-9	Cadmium	5.7			P
7440-70-2	Calcium	236000			P
7440-47-3	Chromium	0.40	U		P
7440-48-4	Cobalt	1.8	B		P
7440-50-8	Copper	2.5	B		P
7439-89-6	Iron	717			P
7439-92-1	Lead	2.8	B		P
7439-95-4	Magnesium	21300			P
7439-96-5	Manganese	1540			P
7439-97-6	Mercury	0.11	B		CV
7440-02-0	Nickel	3.5	B		P
7440-09-7	Potassium	2600			P
7782-49-2	Selenium	2.2	U	N	P
7440-22-4	Silver	0.60	U		P
7440-23-5	Sodium	12600			P
7440-28-0	Thallium	3.2	U		P
7440-62-2	Vanadium	0.40	U		P
7440-66-6	Zinc	1320			P

Color Before: COLORLESS

Clarity Before: CLEAR_

Texture: _____

Color After: YELLOW_

Clarity After: CLEAR_

Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

RS-SW-6

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: Q1241_

Matrix (soil/water): WATER Lab Sample ID: Q1241-6

Level (low/med): LOW Date Received: 04/15/00

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	274	-		P
7440-36-0	Antimony	2.1	U		P
7440-38-2	Arsenic	2.3	U		P
7440-39-3	Barium	23.3			P
7440-41-7	Beryllium	0.60	B		P
7440-43-9	Cadmium	16.8	-		P
7440-70-2	Calcium	236000	-		P
7440-47-3	Chromium	0.56	B		P
7440-48-4	Cobalt	3.1	B		P
7440-50-8	Copper	21.7	-		P
7439-89-6	Iron	2280	-		P
7439-92-1	Lead	9.5	-		P
7439-95-4	Magnesium	20200	-		P
7439-96-5	Manganese	1830	-		P
7439-97-6	Mercury	0.11	B		CV
7440-02-0	Nickel	5.9	-		P
7440-09-7	Potassium	1740	-		P
7782-49-2	Selenium	2.2	U	N	P
7440-22-4	Silver	0.60	U		P
7440-23-5	Sodium	11300	-		P
7440-28-0	Thallium	3.2	U		P
7440-62-2	Vanadium	0.40	U		P
7440-66-6	Zinc	3400	-		P
			-		
			-		

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

RS-SE-1

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: R1241_

Matrix (soil/water): SOIL_ Lab Sample ID: R1241-1

Level (low/med): LOW_ Date Received: 04/15/00

% Solids: 5.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	31000	—	*	P
7440-36-0	Antimony	8.5	B	—	P
7440-38-2	Arsenic	48.4	—	—	P
7440-39-3	Barium	280	—	*	P
7440-41-7	Beryllium	19.2	—	E	P
7440-43-9	Cadmium	115	—	*	P
7440-70-2	Calcium	26000	—	*	P
7440-47-3	Chromium	38.4	—	E	P
7440-48-4	Cobalt	24.4	—	*	P
7440-50-8	Copper	4190	—	—	P
7439-89-6	Iron	281000	—	—	P
7439-92-1	Lead	1180	—	*	P
7439-95-4	Magnesium	17600	—	*	P
7439-96-5	Manganese	10900	—	*	P
7439-97-6	Mercury	0.38	B	—	CV
7440-02-0	Nickel	44.4	—	*	P
7440-09-7	Potassium	2990	—	—	P
7782-49-2	Selenium	3.9	U	N	P
7440-22-4	Silver	19.5	—	N	P
7440-23-5	Sodium	3980	—	—	P
7440-28-0	Thallium	27.1	—	—	P
7440-62-2	Vanadium	41.6	—	E	P
7440-66-6	Zinc	23700	—	—	P

Color Before: BROWN_ Clarity Before: _____ Texture: FINE_

Color After: YELLOW_ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

RS-SE-2

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: R1241_

Matrix (soil/water): SOIL_ Lab Sample ID: R1241-2

Level (low/med): LOW_ Date Received: 04/15/00

% Solids: 9.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	14100	-	*	P
7440-36-0	Antimony	2.6	B		P
7440-38-2	Arsenic	11.4	-		P
7440-39-3	Barium	29.5	-	*	P
7440-41-7	Beryllium	8.5	-	E	P
7440-43-9	Cadmium	114	-	*	P
7440-70-2	Calcium	83400	-	*	P
7440-47-3	Chromium	11.3	-	E	P
7440-48-4	Cobalt	12.7	-	*	P
7440-50-8	Copper	2460	-		P
7439-89-6	Iron	128000	-		P
7439-92-1	Lead	200	-	*	P
7439-95-4	Magnesium	2660	-	*	P
7439-96-5	Manganese	4260	-	*	P
7439-97-6	Mercury	0.21	B		CV
7440-02-0	Nickel	23.3	-	*	P
7440-09-7	Potassium	225	B		P
7782-49-2	Selenium	2.3	U	N	P
7440-22-4	Silver	0.85	B	N	P
7440-23-5	Sodium	8600	-		P
7440-28-0	Thallium	12.9	-		P
7440-62-2	Vanadium	7.5	B	E	P
7440-66-6	Zinc	27000	-		P

Color Before: BROWN_ Clarity Before: _____ Texture: FINE_

Color After: YELLOW_ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

RS-SE-3

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: R1241_

Matrix (soil/water): SOIL_ Lab Sample ID: R1241-3

Level (low/med): LOW_ Date Received: 04/15/00

% Solids: 80.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5170	—	*	P
7440-36-0	Antimony	0.42	B	—	P
7440-38-2	Arsenic	9.5	—	—	P
7440-39-3	Barium	89.3	—	*	P
7440-41-7	Beryllium	0.65	—	E	P
7440-43-9	Cadmium	0.40	B	*	P
7440-70-2	Calcium	36600	—	*	P
7440-47-3	Chromium	7.6	—	E	P
7440-48-4	Cobalt	5.6	—	*	P
7440-50-8	Copper	14.7	—	—	P
7439-89-6	Iron	14900	—	—	P
7439-92-1	Lead	26.3	—	*	P
7439-95-4	Magnesium	4060	—	*	P
7439-96-5	Manganese	508	—	*	P
7439-97-6	Mercury	0.04	—	—	CV
7440-02-0	Nickel	11.3	—	*	P
7440-09-7	Potassium	1310	—	—	P
7782-49-2	Selenium	0.26	U	N	P
7440-22-4	Silver	0.07	U	N	P
7440-23-5	Sodium	224	B	—	P
7440-28-0	Thallium	0.70	B	—	P
7440-62-2	Vanadium	12.9	—	E	P
7440-66-6	Zinc	94.1	—	—	P

Color Before: BROWN_ Clarity Before: _____ Texture: COARSE

Color After: YELLOW_ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

RS-SE-4

Lab Name: COMPUCHEM

Contract: _____

Lab Code: LIBRTY

Case No.: _____

SAS No.: _____

SDG No.: R1241

Matrix (soil/water): SOIL

Lab Sample ID: R1241-4

Level (low/med): LOW

Date Received: 04/15/00

% Solids: 63.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5490	—	*	P
7440-36-0	Antimony	0.80	B	—	P
7440-38-2	Arsenic	10.1	—	—	P
7440-39-3	Barium	104	—	*	P
7440-41-7	Beryllium	0.64	B	E	P
7440-43-9	Cadmium	0.76	—	*	P
7440-70-2	Calcium	9670	—	*	P
7440-47-3	Chromium	7.4	—	E	P
7440-48-4	Cobalt	5.8	—	*	P
7440-50-8	Copper	26.3	—	—	P
7439-89-6	Iron	16900	—	—	P
7439-92-1	Lead	41.6	—	*	P
7439-95-4	Magnesium	4250	—	*	P
7439-96-5	Manganese	830	—	*	P
7439-97-6	Mercury	0.05	B	—	CV
7440-02-0	Nickel	11.8	—	*	P
7440-09-7	Potassium	1080	—	—	P
7782-49-2	Selenium	0.33	U	N	P
7440-22-4	Silver	0.62	B	N	P
7440-23-5	Sodium	216	B	—	P
7440-28-0	Thallium	1.4	B	—	P
7440-62-2	Vanadium	14.9	—	E	P
7440-66-6	Zinc	157	—	—	P
—	—	—	—	—	—
—	—	—	—	—	—

Color Before: BROWN

Clarity Before: _____

Texture: COARSE

Color After: YELLOW

Clarity After: _____

Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

RS-SE-5

Lab Name: COMPUCHEM

Contract: 000

Lab Code: LIBRTY

Case No.: _____

SAS No.: _____

SDG No.: R1241_

Matrix (soil/water): SOIL_

Lab Sample ID: R1241-5

Level (low/med): LOW_

Date Received: 04/15/00

% Solids: 19.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	12100	—	*	P
7440-36-0	Antimony	4.5	B	—	P
7440-38-2	Arsenic	35.1	—	—	P
7440-39-3	Barium	200	—	*	P
7440-41-7	Beryllium	4.3	—	E	P
7440-43-9	Cadmium	51.4	—	*	P
7440-70-2	Calcium	7790	—	*	P
7440-47-3	Chromium	15.7	—	E	P
7440-48-4	Cobalt	56.9	—	*	P
7440-50-8	Copper	722	—	—	P
7439-89-6	Iron	80200	—	—	P
7439-92-1	Lead	796	—	*	P
7439-95-4	Magnesium	7040	—	*	P
7439-96-5	Manganese	19000	—	*	P
7439-97-6	Mercury	0.11	B	—	CV
7440-02-0	Nickel	40.8	—	*	P
7440-09-7	Potassium	1730	—	—	P
7782-49-2	Selenium	3.4	—	N	P
7440-22-4	Silver	17.0	—	N	P
7440-23-5	Sodium	1400	—	—	P
7440-28-0	Thallium	6.7	—	—	P
7440-62-2	Vanadium	18.0	—	E	P
7440-66-6	Zinc	7760	—	—	P

Color Before: BROWN_

Clarity Before: _____

Texture: FINE_

Color After: YELLOW_

Clarity After: _____

Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

RS-SE-6

Lab Name: COMPUCHEM _____ Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: R1241_

Matrix (soil/water): SOIL_ Lab Sample ID: R1241-6

Level (low/med): LOW_ Date Received: 04/15/00

% Solids: _14.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	13800	-	*	P
7440-36-0	Antimony	2.5	B		P
7440-38-2	Arsenic	12.6	-		P
7440-39-3	Barium	54.3	-	*	P
7440-41-7	Beryllium	8.6	-	E	P
7440-43-9	Cadmium	113	-	*	P
7440-70-2	Calcium	88300	-	*	P
7440-47-3	Chromium	10.1	-	E	P
7440-48-4	Cobalt	14.2	-	*	P
7440-50-8	Copper	2370	-		P
7439-89-6	Iron	120000	-		P
7439-92-1	Lead	276	-	*	P
7439-95-4	Magnesium	4160	-	*	P
7439-96-5	Manganese	5330	-	*	P
7439-97-6	Mercury	0.15	B		CV
7440-02-0	Nickel	24.2	-	*	P
7440-09-7	Potassium	459	B		P
7782-49-2	Selenium	1.5	U	N	P
7440-22-4	Silver	2.1	B	N	P
7440-23-5	Sodium	1990	U		P
7440-28-0	Thallium	11.7	-		P
7440-62-2	Vanadium	8.4	B	E	P
7440-66-6	Zinc	25300	-		P

Color Before: BROWN_ Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW_ Clarity After: _____ Artifacts: _____

Comments:

Poor Quality Original

**The following document images
have been scanned from the best
available original copy.**

UOSURS Operating Services, Inc.
1099 18th Street, Suite 710, Denver, CO 80202SHIP TO: Comp D Chem (Lab Mike Rowe)
501 Madison Ave
CART, NJ 07017-4005**CHAIN OF CUSTODY RECORD**

PROJECT NO./NAME:

00410/Rico

SITE MANAGER:

Sims

SAMPLER'S SIGNATURE:

L. Rico

Number of Containers

TAL METALS

(24 HR
TAT)

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	Number of Containers	TAL METALS	REMARKS
RS-SW-1	4/14	10:10		X	Upper Pond	2/3	1	018301, 018302, 018303
SE-1	4/14	10:15			Upper Pond	2/3	1	018302, 018303, 018304
SW-2	4/14	11:00			Lower Pond	2/3	1	018370, 018371, 018372
SE-2	4/14	11:00			Lower Pond	2	1	018370, 018372
SW-3	4/14	12:00			Shoreline	2	1	018380, 018383
SE-3	4/14	12:00			Shoreline	2	1	018380, 018383
SW-4	4/14	12:00			Shoreline	2/3	1	018374, 018379, 018380
SE-4	4/14	12:00			Shoreline	2	1	018382, 018381
SE-5	4/14	12:55			NDWS, DEEPER POND	2	1	018373, 018372
SW-5	4/14	12:55			" "	2/3	1	018373, 018370, 018371
SE-6	4/14	11:00			Pond	2	1	018372, 018370
SW-6	4/14	11:00		✓	Pond	2	1	018373, 018370, 018371

RELINQUISHED BY: (Signature)

L. Rico

DATE TIME

4/14/00 12:55

RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature)

DATE TIME

RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature)

DATE TIME

RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature)

DATE TIME

RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature)

DATE TIME

RECEIVED FOR LABORATORY BY: (Signature)

DATE TIME

REMARKS:
AIRBILL NUMBER:

APPENDIX D

Analytical Review Report

Data Review Report

Site:	Rico Town Pond
TDD No. / Report No.:	0004-0010
Laboratory:	CompuChem
Samples/Matrix:	6/Soil
Analyses:	TAL Metals by SW-846-6010 & 7471
Sampling Date/Sample ID	RS-SE-1, RS-SE-2, RS-SE-3, RS-SE-4, RS-SE-5, RS-SE-6
Reviewer:	Duane Newell
Review Date:	04/27/00

TAL Metals by SW-846-6010 & 7471

- All holding times were met.
- All requisite documentation was present.
- The following problems were encountered:
 1. Prep blank results for chromium (0.53mg/Kg) and zinc (2.19mg/Kg) were above the IDL but below the CRDL. Sample results are qualified UJ.
 2. The matrix spike recoveries for selenium (62.6%) and silver (68.9%) were below the QC criteria (75-125%). Samples may be biased low.
 3. Sample duplicate results for aluminum (22.8%), barium (53.0%), cadmium (20.9%), calcium (26.8%), cobalt (59.7%), lead (42.5%), magnesium (57.4%), manganese (52.4%), and nickel (30.2%) were greater than QC criteria (20%), indicating possible lack of sample homogeneity or matrix interference.
 4. Serial dilution results for beryllium (17.8%), chromium (10.2%), and vanadium (10.4%) were greater than QC criteria (10%) indicating possible matrix interference.
- No other exceptions to the checklist were found.

URS Operating Services Metals Data Review Checklist

Method: Metals by SW-846-6010 & 7441

Site: Rico Town Pond

Laboratory: CompuChem

Case No.: _____

SDG No.: R1241

Lab Batch No.: _____

Samples/Matrix: 6/Soil

Reviewer: Duane Newell

Date: 4/27/00

	Yes	No	N/A	Not Evaluated	Data Affected (Y/N)
1. Data Package					
1a. Was a case narrative included in the data package?	<u>X</u>	_____	_____	_____	_____
1b. Was a copy of the chain of custody provided?	<u>X</u>	_____	_____	_____	_____
Comments: _____					
2. Holding Times					
2a. Were holding times met?	<u>X</u>	_____	_____	_____	_____
2b. Were samples preserved correctly?	<u>X</u>	_____	_____	_____	_____
Comments: <u>Collected 4/14/00, Analyzed 4/17/00</u>					
3. Calibration					
3a. Were all instruments calibrated with a blank and the correct number of standards?	<u>X</u>	_____	_____	_____	_____
3b. Were calibration verifications (ICV and CCV) analyzed at the correct frequency?	<u>X</u>	_____	_____	_____	_____
3c. Were all ICV and CCV percent recoveries within criteria?	<u>X</u>	_____	_____	_____	_____
3d. Were ICV and CCV summary forms provided (Form 2A or equivalent)?	<u>X</u>	_____	_____	_____	_____
3e. Were CRDL check samples (CRIs and CRAs) analyzed at the correct frequency?	<u>X</u>	_____	_____	_____	_____
3f. Were CRI and CRA summary forms provided (Form 2B or equivalent)?	<u>X</u>	_____	_____	_____	_____
Comments: _____					
4. Blanks					
4a. Were blanks (PB, ICB, and CCB) analyzed at the proper frequency?	<u>X</u>	_____	_____	_____	_____
4b. Were blanks free of contamination? Contamination greater than CRDL?	<u>X</u>	_____	_____	_____	_____
4c. Were prep blank results less than the CRDL?	_____	<u>X</u>	_____	_____	<u>X</u>
4d. Were blank summary forms provided (Form 3 or equivalent)?	<u>X</u>	_____	_____	_____	_____
Comments: <u>PB: Chromium 0.53, Zinc 2.19</u>					
5. ICP Interference Check Sample (ICS)					
5a. Were ICS solutions A and AB analyzed at the proper frequency?	<u>X</u>	_____	_____	_____	_____
5b. Were the ICSAB solution results within criteria?	<u>X</u>	_____	_____	_____	_____
5c. Were ICS summary forms provided (Form 4 or equivalent)?	<u>X</u>	_____	_____	_____	_____
Comments: _____					
6. Spike Sample Analysis					
6a. Were matrix spikes performed for each matrix?	<u>X</u>	_____	_____	_____	_____
6b. Were matrix spike results within criteria?	_____	<u>X</u>	_____	_____	<u>X</u>
6c. Was a post-digestion matrix spike analyzed, as required?	<u>X</u>	_____	_____	_____	_____
6d. Were matrix spike summary forms provided (Form 5A/B or equivalent)?	<u>X</u>	_____	_____	_____	_____
Comments: <u>MS: Selenium low recovery 62.6% Post recovery 87.5%, Silver low recovery 68.9% MSD: Selenium low recovery 43.3% Post recovery 87.5 %, Silver low recovery 64.4%, Post not required for Silver.</u>					

URS Operating Services Metals Data Review Checklist

	Yes	No	N/A	Not Evaluated	Data Affected (Y/N)
7. Duplicate Sample Analysis					
7a. Were laboratory duplicates performed for each matrix?	<u>X</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
7b. Were duplicate results within criteria?	<u> </u>	<u>X</u>	<u> </u>	<u> </u>	<u>X</u>
7c. Were duplicate summary forms provided (Form 6 or equivalent)?	<u>X</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Comments: <u>RPD's out: Aluminum 22.8%, Barium 53.0%, Cadmium 20.9%, Calcium 26.8%, Cobalt 59.7%, Lead 42.5%, Magnesium 57.4%, Manganese 52.4%, Nickel 30.2%</u>					
8. Laboratory Control Samples (LCS)					
8a. Were LCSs analyzed for each matrix?	<u>X</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
8b. Were LCS results within criteria?	<u>X</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
8c. Were LCS summary forms provided (Form 7 or equivalent)?	<u>X</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Comments: <u> </u>					
9. Graphite Furnace Atomic Absorption QC					
9a. Were analytical spikes performed for each sample?	<u> </u>	<u> </u>	<u>X</u>	<u> </u>	<u> </u>
9b. Were spike recoveries within criteria?	<u> </u>	<u> </u>	<u>X</u>	<u> </u>	<u> </u>
9c. Were MSAs analyzed as required?	<u> </u>	<u> </u>	<u>X</u>	<u> </u>	<u> </u>
9d. Were MSA correlation coefficients greater than 0.995?	<u> </u>	<u> </u>	<u>X</u>	<u> </u>	<u> </u>
9e. Were MSA summary forms provided (Form 8 or equivalent)?	<u> </u>	<u> </u>	<u>X</u>	<u> </u>	<u> </u>
Comments: <u> </u>					
10. ICP Serial Dilution					
10a. Were serial dilutions performed for each matrix?	<u>X</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
10b. Were serial dilution results within criteria?	<u> </u>	<u>X</u>	<u> </u>	<u> </u>	<u>X</u>
10c. Were serial dilution summary forms provided (Form 9 or equivalent)?	<u>X</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Comments: <u>%D: Beryllium 17.8%, Chromium 10.2%, Vanadium 10.4%, Limit 10%</u>					
11. Sample Results					
11a. Were all sample raw data provided?	<u>X</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
11b. Were percent solids data provided?	<u>X</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
11c. Were digestion/distillation logs provided?	<u>X</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
11d. Were TCLP digestion logs provided?	<u> </u>	<u> </u>	<u>X</u>	<u> </u>	<u> </u>
11e. Were all sample results reported (Form 1 or equivalent)?	<u>X</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
11f. Were current IDLs provided (Form 10 or equivalent)?	<u>X</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
11g. Were ICP interelement correction factors provided (Forms 11A and 11B or equivalent)?	<u>X</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
11h. Were ICP linear ranges provided (Form 12 or equivalent)?	<u>X</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
11i. Were preparation log summaries provided (Form 13 or equivalent)?	<u>X</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
11j. Were analysis run log summaries provided (Form 14 or equivalent)?	<u>X</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Comments: <u> </u>					

1 Only summary forms are reviewed for outliers and only the presence of raw data are verified. These checklists are to be used as a data completeness review rather than a technical review with data qualifiers assigned to results.

2 For CLP methods, use the National Functional Guidelines for Inorganic Data Review (NFG-IDR) to evaluate criteria. For non-CLP, use reasonable laboratory QC limits and/or method criteria to evaluate criteria. Also refer to TechLaw's Quality Control Data Review and Data Validation for the EPA START Program (10/99).

**URS Operating Services
Metals Data Review Checklist**

Item #	Outlier (and analyte if applicable)	Criteria	Affected samples
1	MS: Selenium low recovery 62.6% Post recovery 87.5%, Silver low recovery 68.9% MSD: Selenium low recovery 43.3% Post recovery 87.5 %, Silver low recovery 64.4%, Post not required for Silver.	75-125%	ALL
2	RPD's out: Aluminum 22.8%, Barium 53.0%, Cadmium 20.9%, Calcium 26.8%, Cobalt 59.7%, Lead 42.5%, Magnesium 57.4%, Manganese 52.4%, Nickel 30.2%	+/-20% RPD	ALL
3	Prep Blank Contamination: Chromium 0.53 ppb, Zinc 2.19 ppb	<= IDL	ALL
4	Serial dilution %D results: Beryllium 17.8%, Chromium 10.2%, Vanadium 10.4%	Limit 10%	ALL

Comments:

Data Review Report

Site:	Rico Town Pond
TDD No. / Report No.:	0004-0010
Laboratory:	CompuChem
Samples/Matrix:	6/Water
Analyses:	TAL Metals by SW-846-6010 & 7470
Sampling Date/Sample ID	RS-SW-1, RS-SW-2, RS-SW-3, RS-SW-4, RS-SW-5, RS-SW-6
Reviewer:	Duane Newell
Review Date:	04/27/00

TAL Metals by SW-846-6010 & 7470

- All holding times were met.
- All requisite documentation was present.
- The following problems were encountered:

The matrix spike recovery for selenium was below the QC criteria. Samples may be biased low and should be qualified J/UJ.

- No other exceptions to the checklist were found.

URS Operating Services Metals Data Review Checklist

Method: Metals by SW-846-6010 & 7440
Case No.: _____
Samples/Matrix: 6/Water

Site: Rico Town Pond
SDG No.: Q1241
Reviewer: Duane Newell

Laboratory: CompuChem
Lab Batch No.: _____
Date: 4/27/00

	Yes	No	N/A	Not Evaluated	Data Affected (Y/N)
1. Data Package					
1a. Was a case narrative included in the data package?	<u>X</u>	_____	_____	_____	_____
1b. Was a copy of the chain of custody provided?	<u>X</u>	_____	_____	_____	_____
Comments: _____					
<hr/>					
2. Holding Times					
2a. Were holding times met?	<u>X</u>	_____	_____	_____	_____
2b. Were samples preserved correctly?	<u>X</u>	_____	_____	_____	_____
Comments: <u>Collected 4/14/00, Analyzed 4/17/00</u>					
<hr/>					
3. Calibration					
3a. Were all instruments calibrated with a blank and the correct number of standards?	<u>X</u>	_____	_____	_____	_____
3b. Were calibration verifications (ICV and CCV) analyzed at the correct frequency?	<u>X</u>	_____	_____	_____	_____
3c. Were all ICV and CCV percent recoveries within criteria?	<u>X</u>	_____	_____	_____	_____
3d. Were ICV and CCV summary forms provided (Form 2A or equivalent)?	<u>X</u>	_____	_____	_____	_____
3e. Were CRDL check samples (CRIs and CRAs) analyzed at the correct frequency?	<u>X</u>	_____	_____	_____	_____
3f. Were CRI and CRA summary forms provided (Form 2B or equivalent)?	<u>X</u>	_____	_____	_____	_____
Comments: _____					
<hr/>					
4. Blanks					
4a. Were blanks (PB, ICB, and CCB) analyzed at the proper frequency?	<u>X</u>	_____	_____	_____	_____
4b. Were blanks free of contamination? Contamination greater than CRDL?	<u>X</u>	_____	_____	_____	_____
4c. Were prep blank results less than the CRDL?	<u>X</u>	_____	_____	_____	_____
4d. Were blank summary forms provided (Form 3 or equivalent)?	<u>X</u>	_____	_____	_____	_____
Comments: _____					
<hr/>					
5. ICP Interference Check Sample (ICS)					
5a. Were ICS solutions A and AB analyzed at the proper frequency?	<u>X</u>	_____	_____	_____	_____
5b. Were the ICSAB solution results within criteria?	<u>X</u>	_____	_____	_____	_____
5c. Were ICS summary forms provided (Form 4 or equivalent)?	<u>X</u>	_____	_____	_____	_____
Comments: _____					
<hr/>					
6. Spike Sample Analysis					
6a. Were matrix spikes performed for each matrix?	<u>X</u>	_____	_____	_____	_____
6b. Were matrix spike results within criteria?	_____	<u>X</u>	_____	_____	<u>X</u>
6c. Was a post-digestion matrix spike analyzed, as required?	<u>X</u>	_____	_____	_____	_____
6d. Were matrix spike summary forms provided (Form 5A/B or equivalent)?	<u>X</u>	_____	_____	_____	_____
Comments: <u>Selenium low recovery 67.6% Post recovery 92.3%</u>					
<hr/>					

URS Operating Services Metals Data Review Checklist

	Yes	No	N/A	Not Evaluated	Data Affected (Y/N)
7. Duplicate Sample Analysis					
7a. Were laboratory duplicates performed for each matrix?	<u>X</u>	_____	_____	_____	_____
7b. Were duplicate results within criteria?	<u>X</u>	_____	_____	_____	_____
7c. Were duplicate summary forms provided (Form 6 or equivalent)?	<u>X</u>	_____	_____	_____	_____
Comments: _____					
8. Laboratory Control Samples (LCS)					
8a. Were LCSs analyzed for each matrix?	<u>X</u>	_____	_____	_____	_____
8b. Were LCS results within criteria?	<u>X</u>	_____	_____	_____	_____
8c. Were LCS summary forms provided (Form 7 or equivalent)?	<u>X</u>	_____	_____	_____	_____
Comments: _____					
9. Graphite Furnace Atomic Absorption QC					
9a. Were analytical spikes performed for each sample?	_____	_____	<u>X</u>	_____	_____
9b. Were spike recoveries within criteria?	_____	_____	<u>X</u>	_____	_____
9c. Were MSAs analyzed as required?	_____	_____	<u>X</u>	_____	_____
9d. Were MSA correlation coefficients greater than 0.995?	_____	_____	<u>X</u>	_____	_____
9e. Were MSA summary forms provided (Form 8 or equivalent)?	_____	_____	<u>X</u>	_____	_____
Comments: _____					
10. ICP Serial Dilution					
10a. Were serial dilutions performed for each matrix?	<u>X</u>	_____	_____	_____	_____
10b. Were serial dilution results within criteria?	<u>X</u>	_____	_____	_____	_____
10c. Were serial dilution summary forms provided (Form 9 or equivalent)?	<u>X</u>	_____	_____	_____	_____
Comments: _____					
11. Sample Results					
11a. Were all sample raw data provided?	<u>X</u>	_____	_____	_____	_____
11b. Were percent solids data provided?	_____	_____	<u>X</u>	_____	_____
11c. Were digestion/distillation logs provided?	<u>X</u>	_____	_____	_____	_____
11d. Were TCLP digestion logs provided?	_____	_____	<u>X</u>	_____	_____
11e. Were all sample results reported (Form 1 or equivalent)?	<u>X</u>	_____	_____	_____	_____
11f. Were current IDLs provided (Form 10 or equivalent)?	<u>X</u>	_____	_____	_____	_____
11g. Were ICP interelement correction factors provided (Forms 11A and 11B or equivalent)?	<u>X</u>	_____	_____	_____	_____
11h. Were ICP linear ranges provided (Form 12 or equivalent)?	<u>X</u>	_____	_____	_____	_____
11i. Were preparation log summaries provided (Form 13 or equivalent)?	<u>X</u>	_____	_____	_____	_____
11j. Were analysis run log summaries provided (Form 14 or equivalent)?	<u>X</u>	_____	_____	_____	_____
Comments: _____					

¹ Only summary forms are reviewed for outliers and only the presence of raw data are verified. These checklists are to be used as a data completeness review rather than a technical review with data qualifiers assigned to results.

² For CLP methods, use the National Functional Guidelines for Inorganic Data Review (NFG-IDR) to evaluate criteria. For non-CLP, use reasonable laboratory QC limits and/or method criteria to evaluate criteria. Also refer to TechLaw's Quality Control Data Review and Data Validation for the EPA START Program (10/99).

**URS Operating Services
Metals Data Review Checklist**

Item #	Outlier (and analyte if applicable)	Criteria	Affected samples
1	Selenium low recovery 67.6%	75-125%	ALL

Comments: _____

